ENGINEERING NEWS-RECORD

Santa Claus on a construction bridge p. 26

A McGRAW-HILL PUBLICATION

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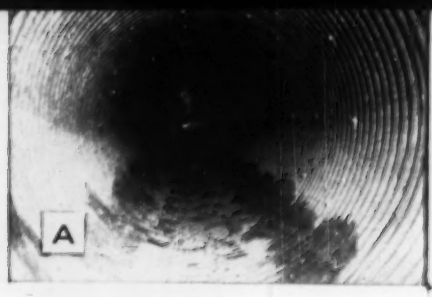
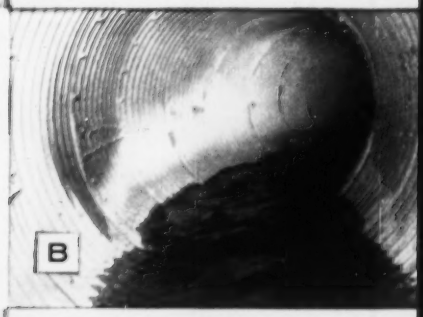


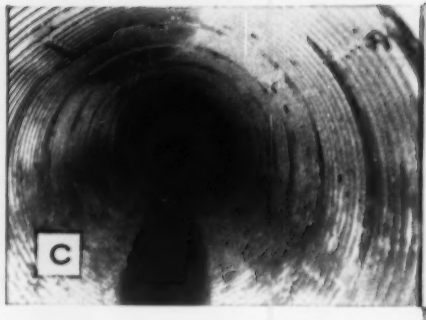
LEFT: This 36-inch-diameter Armco Sewer was recently inspected in a mountain city.

WHICH ARMCO SEWER HAS BEEN INSTALLED 49 Years?

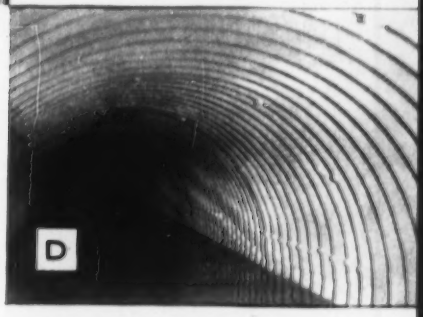


ABOVE: Large diameter Armco Sewer installed in a midwest city.

Hard to tell, isn't it?



LEFT: This Armco Storm Sewer in a midwest city is of 14-gage, 36 inches in diameter.



ABOVE: A large southern city installed this 30-inch-diameter Armco Sewer Structure.

Actually, you can't tell the age of an Armco Sewer just by looking at it. Armco Corrugated Metal Sewer Structures have an outstanding record for long, economical and efficient service.

But in case you are wondering, Armco Sewer (A) has been in service 39 years; sewer (B), 26 years; sewer (C), 19 years; and sewer (D), 28 years. How close did you guess?

Long life is not the only advantage of Armco Sewer Structures: Corrugated metal design provides ample strength for any loading condition. Long lengths speed up installation. Sturdy coupling bands assure tight joints and a continuous conduit. Choice of protective coatings and pavements solves corrosion and erosion problems. Wide size range meets capacity requirements. And unskilled labor can handle the job, saving money at every step.

Write now for complete data on your specific needs. Armco Drainage & Metal Products, Inc., 5156 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Sewer Structures

ARMCO®

Galvanized Corrugated Metal Pipe and Pipe-Arch • Bituminous-Coated Galvanized Pipe and Pipe-Arch • SMOOTH-FLO Sewer Pipe • ASBESTOS-BONDED Pipe and Pipe-Arch • PAVED-INVERT Pipe and Pipe-Arch • MULTI-PLATE Pipe, Arch and Pipe-Arch

Allis-Chalmers HD-16 Crawler Tractor and 315 Scraper—

BIG-CAPACITY DIRT-MOVING TEAM

Allis-Chalmers HD-16 and 315 scraper team gives top dirt-moving production.

With over 16 tons of balanced weight, plus long-life, ground-gripping tracks to take advantage of the heavy-duty power plant — the HD-16 has the capacity for big loads and fast work cycles on scraper operations. Simplified lubrication and maintenance procedures add valuable working time to daily schedules.

In addition, the HD-16 is available either with the 6-speed standard transmission and 141 belt hp, or with job-proved hydraulic torque converter drive and 150 net engine hp to meet your work requirements.

The 20-cu-yd, cable-controlled 315 scraper features a low bowl with curved bottom and offset cutting edge — the most effective design for boiling dirt into the bowl. It gives a live load throughout the loading operation — reduces load resistance to get full capacity fast, with a minimum of tractor effort.

And you get extra advantages with this Allis-Chalmers 315 scraper: correct distribution of loaded weight for easier hauling and longer tire life . . . apron is hinged to ejector instead of to scraper sides, moves forward and upward during spreading for faster, cleaner unloading . . . long, wide pusher block is positioned to protect scraper tires and to deliver in-line push for maximum power to the scraper cutting edge for instant penetration, fast loading.

Check heaps and cycles on your jobs soon. Arrange to see the team designed with BIG production in mind — the Allis-Chalmers HD-16 crawler tractor and 315 scraper.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·

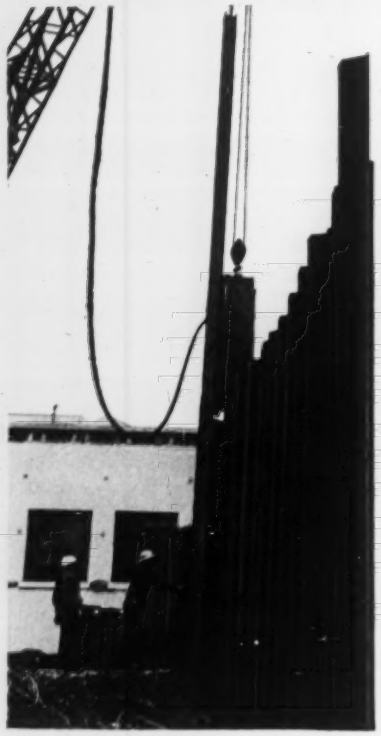
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

SEE YOUR ALLIS-CHALMERS DEALER FOR A DEMONSTRATION . . . SOON!

ALLIS-CHALMERS

At 3 P.M....

CAVE-IN!



Cave-ins will happen, through no fault of the contractor. On this excavation job, there was erratic soil behavior, shifting loads, saturating rain . . . everything unpredictable.

When it happened, L. B. Foster Co. was called at 3 P.M. for rental steel-sheet piling *in a rush*. We cut MP-116 piling in our yard, and delivered it in Foster trucks to the job site 400 miles away before the crews started work next morning.

This is typical of the dependable help contractors can expect . . . and get . . . with Foster's Piling Rental Plan. Always the exact length and exact section . . . when you need it . . . on low fixed cost. Call your nearest Foster office for quotations—find out for yourself the real savings in Renting Piling from Foster.

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EIGHTY-SECOND YEAR OF PUBLICATION

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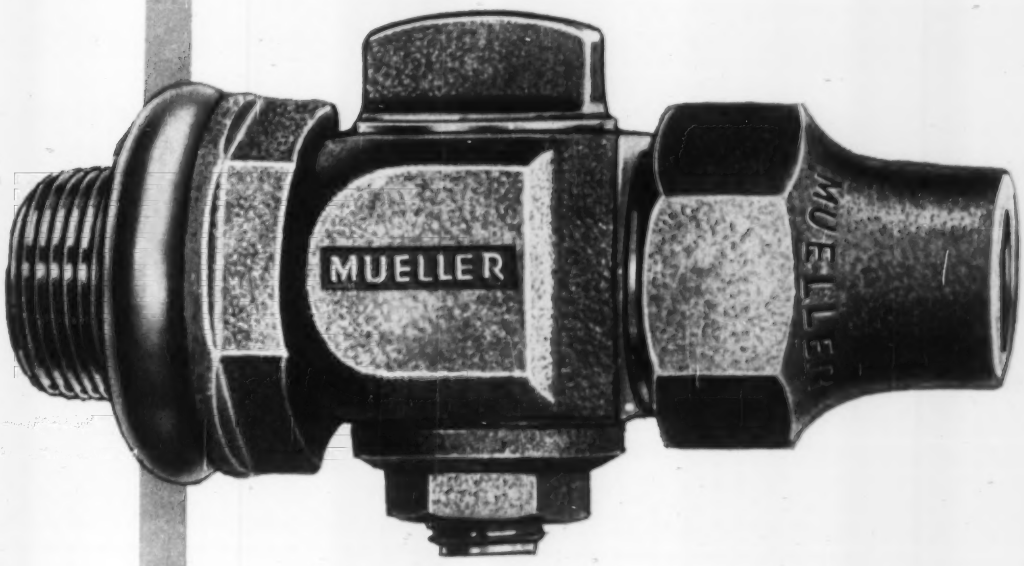
any thread you need!



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A combination of practically any type inlet or outlet thread on Mueller Corporation Stops permits you to connect to any type main and run the service line best suited to your needs. You may have a requirement for connecting to thin walled pipe. For this purpose, use the Mueller compression joint inlet with either copper or increasing I.P. thread outlet. Mueller inlet threads form a strong mechanical connection to the main. The compression joint, composed of a rubber sealing ring encased in a copper retaining ring, is tightened down against the main to provide a pressure-tight seal. Check your particular requirements, then contact your Mueller Representative or write direct for complete information on the corporation stop that will fit your needs.

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MAIN OFFICE & FACTORY DECATUR, ILLINOIS

ANOTHER CASE OF

COPPER

WHERE IT COUNTS

The new Fifth Avenue office of

MANUFACTURERS TRUST COMPANY

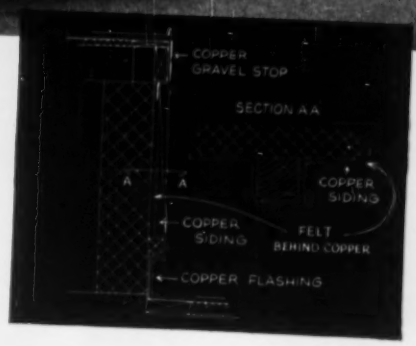
New York, N. Y.

Architects: SKIDMORE, OWINGS & MERRILL, N. Y.
Gen. Cont.: GEORGE A. FULLER COMPANY, NEW YORK
Sheet Metal Cont.: JACOB RINGLE & SON, Jersey City, N. J.

LOUVERS for one of the air conditioning outlets atop the roof of the Manufacturers Trust Company being finished off. 32 oz. Revere Sheet Copper was used for the frame and 24 oz. for the fins. Detail shown at right.

DETAILS OF COPPER LOUVERS FOR EXHAUST PLENUM

MONITOR OF REVERE LEADTEX #15 COPPER of batten seam construction which houses the air conditioning ducts in the Fifth Avenue office of Manufacturers Trust Company. Of enduring, "ageless" copper, the centuries-tested metal, it will not rust, rot or deteriorate, seals against weather damage. One of Revere's Technical Advisors worked with the architects in the design of this monitor. Detail at right.



●In describing this drastic departure in banking institution design, Horace C. Flanigan, President of Manufacturers Trust Company, said, "The architecture of this bank, departing from the classic design of the past, uses to advantage the latest in form, construction and materials."

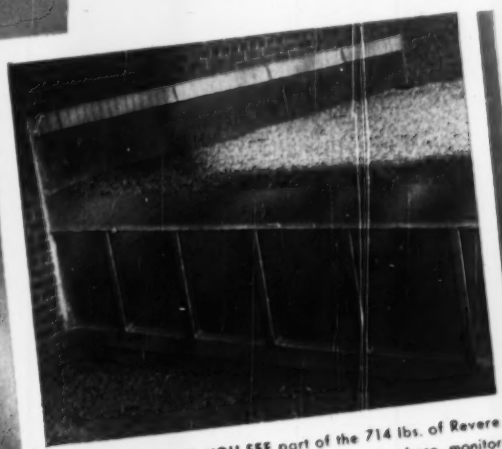
Among those materials is copper, not only man's oldest metal but in modern designs, such as this, man's newest metal, too. From its use on the 6-ton decorative screen of copper, nickel and brass to the flashing and monitor on the roof, the "ageless" metal copper stands ready to serve through the years without rotting, rusting or deteriorating.

In order to blend more perfectly with the off-white glazed brick used on the exterior of this great building, the architects specified Revere Leadtex #15 Sheet Copper. Revere Plain Sheet Copper was also used where color was unimportant. Altogether some 20,000 lbs. of copper were used.

One of the advantages architects will find in working with an organization such as Revere is a wealth of experience that can be a great help to them in many ways. In this particular instance one of Revere's Technical Advisors had the good fortune to be able to work closely with the architects in the design of the monitor which you see in the photograph at the top of this page. The architects and contractors were well pleased with the design which resulted from the Revere man's suggestions.

Why don't you take advantage of Revere's more than 153 years of experience in copper and its alloys? Also, we believe you'll find it worth your while to find out about the many money-saving advantages of Revere Keystone Thru-Wall Flashing.*

*Patented



AT TOP OF PHOTO YOU SEE part of the 714 lbs. of Revere Keystone Thru-Wall, 3-Way Flashing used where monitor joins main wall of building. Weather is kept in its place (outside) with enduring Revere Copper Flashing on the job.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

• • •

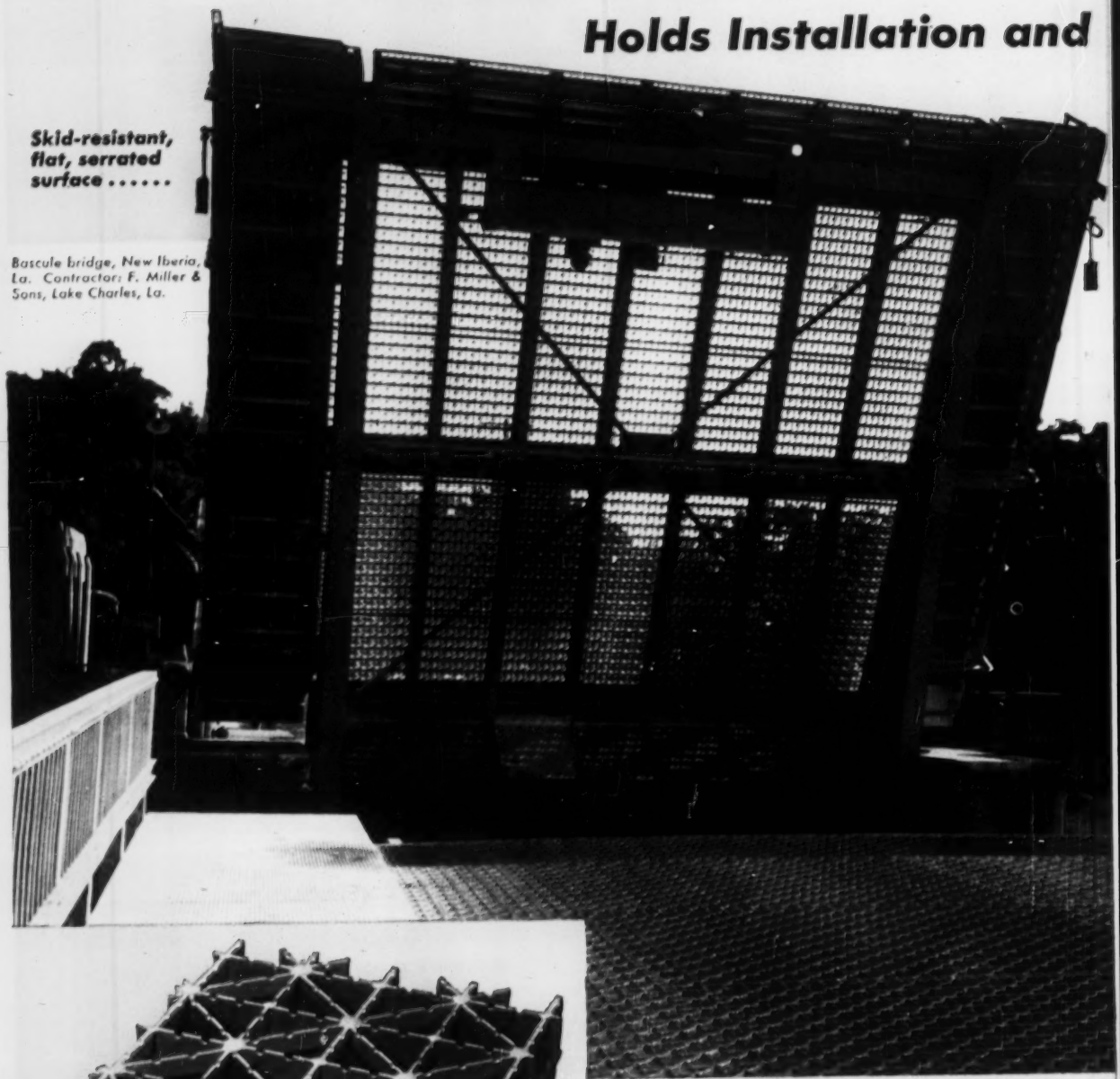
Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere.

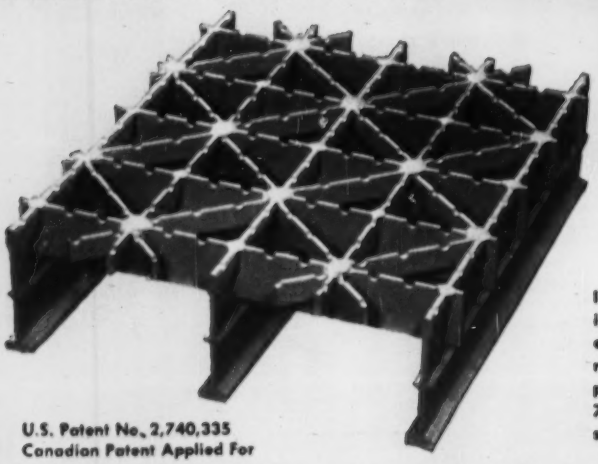
New GREULICH 4-way GRID

Holds Installation and

Skid-resistant, flat, serrated surface .....

Bascule bridge, New Iberia, La. Contractor: F. Miller & Sons, Lake Charles, La.





U.S. Patent No. 2,740,335
Canadian Patent Applied For

Greulich 4-Way Grids

Precision manufactured. Comes out square and rigid, assuring true alignment. Will not rack.

Integrally connected triangles extend over entire roadway insuring maximum lateral or horizontal rigidity and high skid resistance. They are especially adaptable for reflooring old bridges. Solid, 5-inch deep units remain true during shipment, handling and erection. Test data available proving resistance to distortion. Grids made in lengths up to 36 feet and 7 feet 3 inches widths to reduce number of units to be handled and field splices to be made between grids.

from KERRIGAN is Stronger and Quieter!

Handling Costs to a Minimum

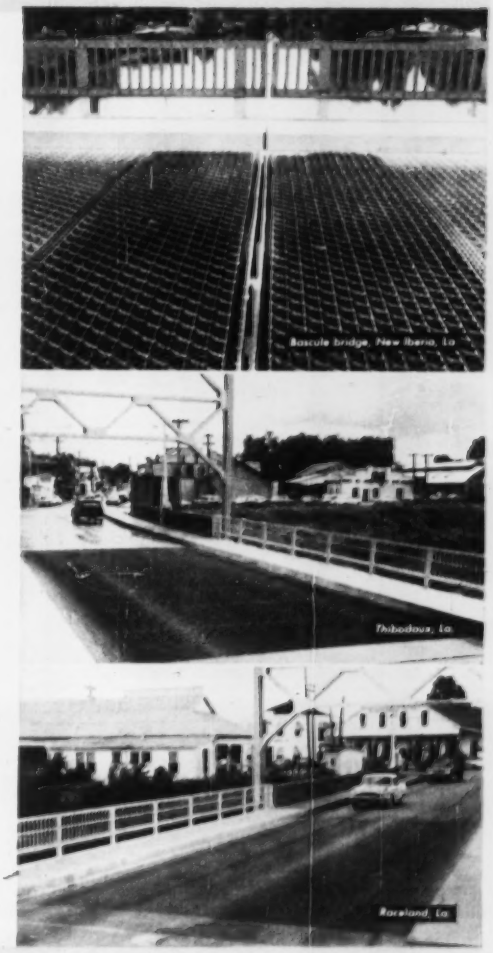
20% Fewer Field Welds in this NEW OPEN STEEL BRIDGE FLOORING

Illustrated here are several of the many Louisiana bridges recently floored with Kerrigan Iron Works' new Greulich 4-way grid. This design permits economy in field erection (without loss of strength) as main bearing members are spaced 7½ inches apart instead of 6 inches, thus requiring fewer field welds. Units are fabricated in panels 7 feet 3 inches wide to hold handling costs to a minimum and still permit hauling on ordinary flat bed trucks. The 4-way grid provides a flat, single plane, serrated surface—gives a straight, smooth ride and reduces tire hum to a minimum. Yet, due to triangular openings and scientifically located serrations in the top surface, it provides greater skid resistance.

In order to keep traffic moving on the bascule bridge shown at left units were cut to half-width areas, then welded together to form a solid, one piece, smooth surface.

This flooring is now being produced in our large, modern production plant, and a large reserve supply of materials is on hand to insure prompt delivery. For further information, write to our bridge flooring division.

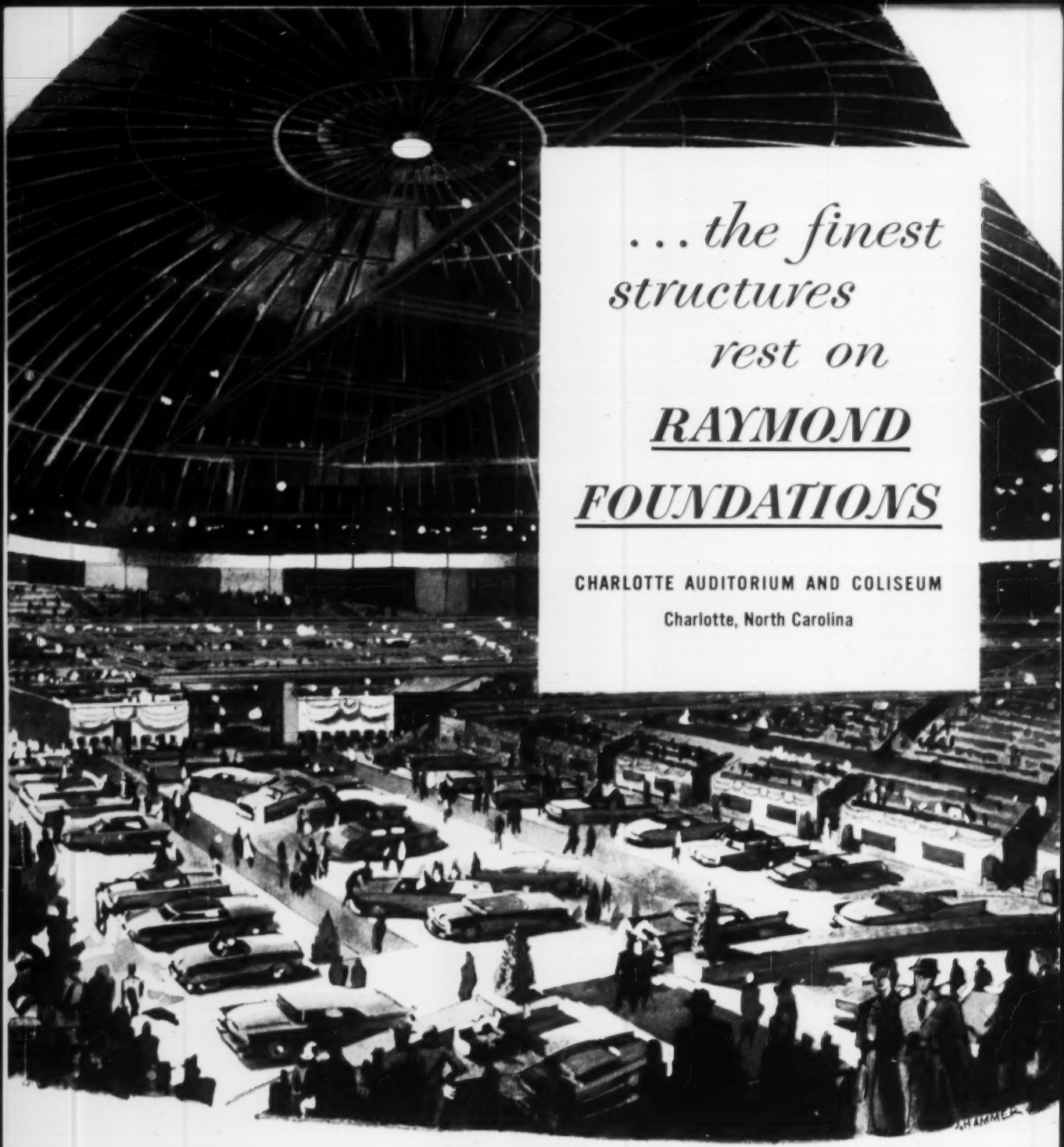
Raceland and Thibodaux contractor: Austin Bridge Co., Dallas & Baton Rouge.



GREULICH Bridge Flooring Division

KERRIGAN IRON WORKS, Inc.

Harvey F. Neel, Manager, Bridge Flooring Division, Nashville, Tenn.
General Sales Office: 274 Madison Ave., New York City



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Reader Comment

Engineer Manpower

SIR—In the Nov. 8 issue of your publication on page 29 of an article entitled "Engineering Manpower Problems in Construction" you list surveyors as technicians. In behalf of the Property Surveys Division of the American Congress on Surveying and Mapping and the Massachusettts Association of Land Surveyors and Civil Engineers the writer takes exception with this statement.

There are several classifications of surveyors but land surveyors definitely do not belong in the same category as route, topographic and construction surveyors as is the probable thought of your article. Please note that practicing land surveyors are professional men by registration and acceptance throughout the profession. Your clarification of this matter and public acknowledgement through the medium of your reader comment, or otherwise, will be appreciated.

GORDON E. AINSWORTH, *Chairman Property Surveys Division, ACSM; President Massachusetts Association of Land Surveyors and Civil Engineers*

[EDITOR'S NOTE: Land Surveyor Ainsworth is so right. We had not him or his fellow professionals in mind, but rather the rodmen, chainmen and other survey men on construction, many of whom could be technicians rather than graduate engineers.]

•

SIR—The Report in the Nov. 8 issue of Engineering News-Record, on the shortage of engineers and what can be done about it, very sagely pointed up the primary position of education in the solution of the problem.

Essentially the free world faces communism, fearing both its production and its ethics. We need engineers and scientists to increase production both of goods and defensive weapons. The problem faced by education is immense for it must show that production and money making are not necessarily synonymous. As long as it is possible to accumulate great wealth by buying and selling and owning property, by medicine and merchandising and law, the best minds will enter these fields which have little bearing on the power of our country to face the peril which daily closes in upon it. Productive tools are our hope; the men to build, develop, and operate them must become the new elite if our society is to survive in the face of the norm, the compulsive production of our enemy.

It may be possible to increase the productivity of the land by increasing a few salaries here and there but communism will not be stopped with business as usual. When the highest paid, most respected positions in our society are scientists, engineers and teachers then we will be secure and need not fear the competition of communism.

FRANCIS G. YATES
Colorado Springs, Colo.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

"High" Dam

SIR—In your article "Abrasive Rock, Asphalt Facing for Water Supply Dam" (ENR Nov. 15, p. 44) you state that the Montgomery Dam spillway crest at El. 10,861 ft above sea level is believed to be higher than any other dam in this country. This may be true for dams of any considerable size, but there is a small concrete dam which forms Bluebird Lake in the Wild Basin of the Rocky Mountain National Park which is somewhat above 11,000 ft according to the USGS map.

Also in column two, three lines from the bottom, you have "North Platte River" instead of "South Platte River."

RALPH W. POWELL
Professor of Engineering Mechanics
The Ohio State University
Columbus, Ohio

More Time for Giving Data

SIR—We would like to call attention to a typographical error in your article, "How to Cut Drafting Costs" (ENR Nov. 8, p. 136).

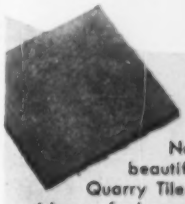
The fourth paragraph as published reads in part: "Records showed that a group leader spends 43% of his time acquiring information, 7% giving information to others . . ." The 7% figure should be 27%.

JAY H. BERGEN
Director, Engineering Services Laboratory
American Machine & Foundry Co.
Greenwich, Conn.

Fast Concreting at Bhakra Dam

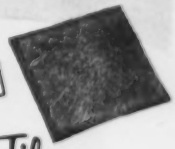
SIR—As long as Guy F. Atkinson Co. is boasting in ENGINEERING NEWS-

New Tiles Galore—for Wall and Floor by Summitville



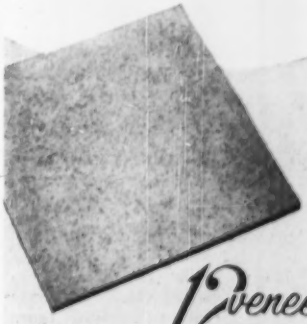
QUARRY TILE

Now available in six beautiful colors. Summitville Quarry Tile is unsurpassed for richness of color and superior chemical, structural and mechanical qualities. No other flooring is so durable and easily maintained.



GLAZED Quarry Tile

The only frost-proof glazed Quarry tile available. Available in a wide range of colors and textures in four sizes with matching trim units. Ideal for light-duty floors, patios, store fronts and swimming pools.



12veneer

A sensational "first" in new product development. This 11⅞" x 11⅞" x ⅜" ceramic unit offers unusual design and color treatments wherever glazed interior tile is specified.

Summitville TILES, INC.

SUMMITVILLE, OHIO

here's the West's Answer to your Concrete Questions!

* **How can you stop slabs from cracking while curing and get hard, dust-free surfaces?**

"Unlike membrane-forming mediums which often rub off, Thompson's Water Seal penetrates the slab for more efficient curing without foundry dust."

U. S. LIFT SLAB CORP., Austin, Texas

* **What separating method assures easy lifting and clean slabs without inherent stain or residue?**

"Thompson's Water Seal worked beautifully on the F.B.I. building — some of the finest slabs we have ever seen."

VAGTBORG LIFT SLAB CORP., Los Angeles, Calif.

* **Is there a form-sealer that assures clean and easy stripping so forms can be used again?**

"On form work and on all lift slab construction, we recommend Thompson's Water Seal. We've used it on many jobs with great success."

SKYHOOK LIFT SLAB CORP., Kansas City, Mo.

THOMPSON'S (deep penetrating) WATER SEAL is now Nationally distributed by

THE PITTSBURGH PLATE GLASS COMPANY

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. . . Reader Comment

RECORD of a concrete placing record for Asia, I thought it might be of interest to your readers to know that at India's Bhakra Dam the present 24-hr record is 8,376 cu yd. This is approximately 75% of plant capacity.

As usual, the placing capacity is limited by the area in which one can place, and such was the condition here as, at the height above bedrock that the structure is now, area is limited both up and downstream and by the narrowness of the gorge. I predict that, as the area becomes available, the placing record will go well above 9,000 cu yd.

M. H. SLOCUM
Bhakra Dam Project
Nangal Township, India

EDITORS NOTE—Harvey Slocum is a little unfair to his friend, Guy Atkinson. The article reffered to was one on Japan's Sakuma Dam (ENR April 19, 1956, p. 38), on which the Atkinson organization is acting as construction consultant. The concrete reference was to 6,775 cu yd placed in a 24-hr period. This, it was said was "probably a world's record for two cableways." Whether the Japanese or an Atkinson man is responsible for the statement is not clear. The article came from our Tokyo Bureau.

Correction:

Inadvertently, a couple of zeros went awry in our report on a contemplated steam plant for the Washington State Power Commission (ENR Nov. 29, p. 28). The price is $50 million for a 335,000-kw plant instead of the $5 million and 305,000 kw originally given.

CALENDAR

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 7-11.

Seventh Annual Sanitary Engineering Conference, University of Kansas, Lawrence, Kan., Jan. 8.

National Association of Home Builders, annual convention and exposition, Hotel Sherman, Hotel Conrad Hilton and Coliseum, Chicago, Ill., Jan. 20-24.

Associated Equipment Distributors, 38th annual meeting, Conrad Hilton Hotel, Chicago, Jan. 27-30.

American Road Builders Association, annual meeting and road show, Chicago Amphitheater, Jan. 28-Feb. 2.

Reinforced Plastics Div., Society of the Plastics Industry, Inc., 12th Annual Technical and Management Conference, Edgewater Beach Hotel, Chicago, Ill., Feb. 5-7.

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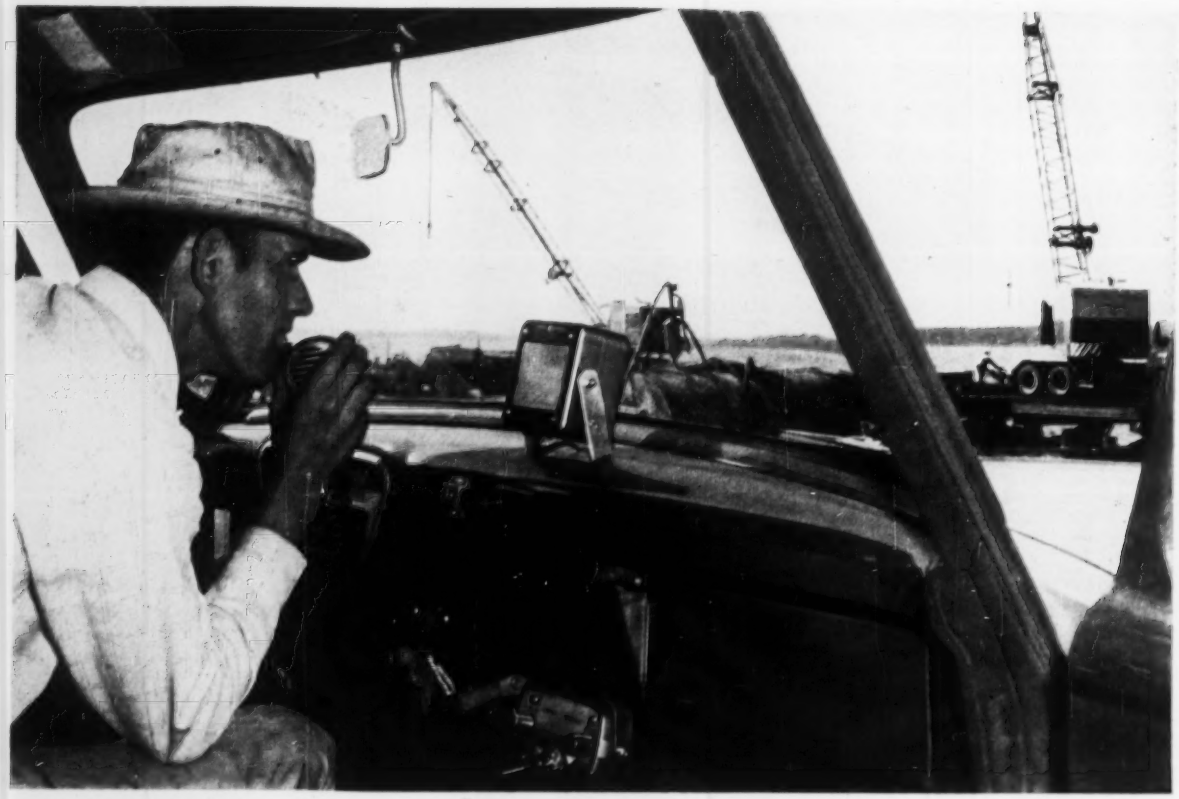

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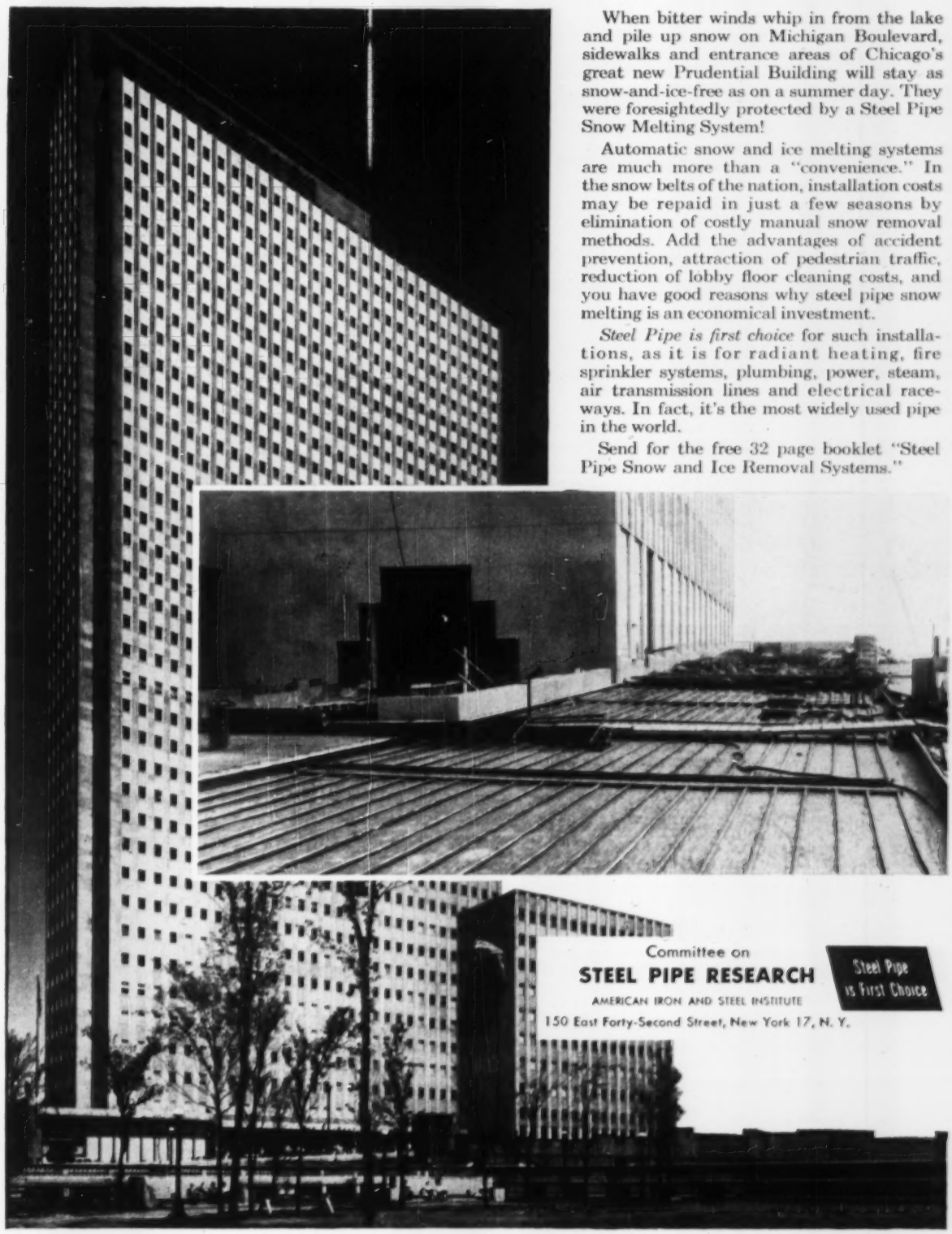

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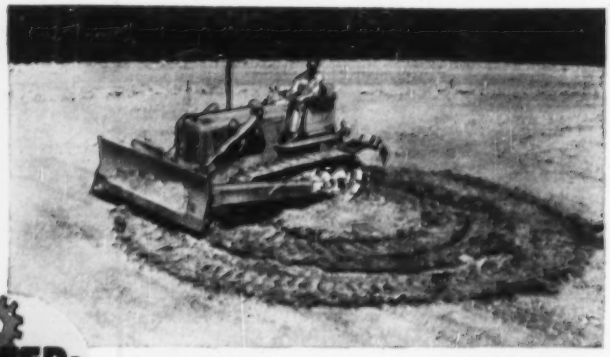

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THE CONSTRUCTION WEEK

STATE'S RIGHT WRONG—The U. S. Supreme Court ruled that a Texas contractor did not have to have an Arkansas state license to do work at the Little Rock Air Force Base. In an opinion read by Chief Justice Earl Warren, the court said: "Subjecting a federal contractor to the Arkansas contractor licensing requirements would give the state licensing board a virtual power of review over the federal determination of 'responsibility' and would thus frustrate the expressed federal policy of selecting the lowest responsible bidder.

The ruling was given in the case of Leslie Miller, Inc., Fort Worth, which was awarded a federal contract in 1954 to build $1,093,431 worth of aircraft refueling facilities at the Little Rock Base.

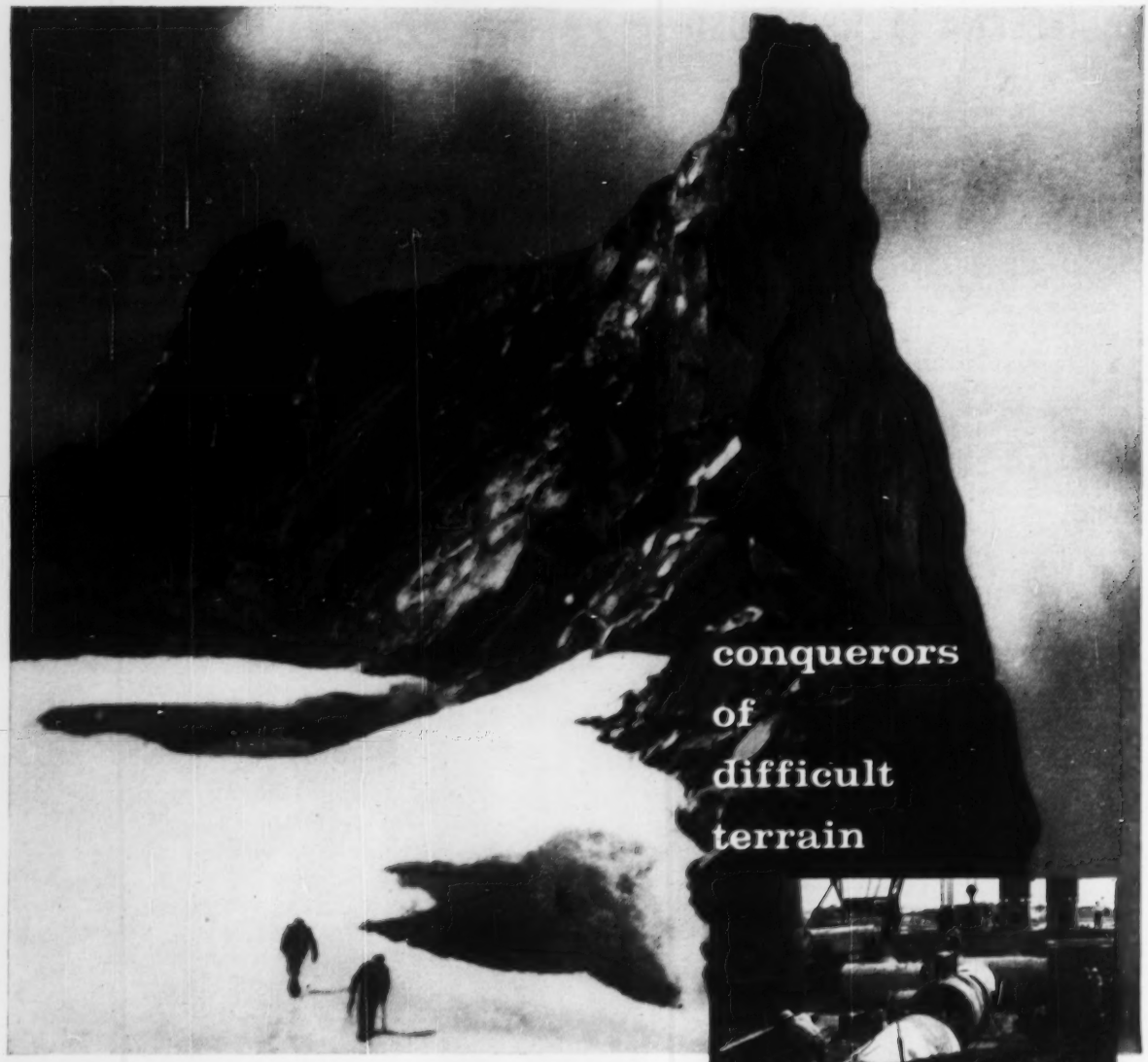
The company was fined $200 in Arkansas state court for starting construction without a state license.

"MERRY CHRISTMAS"—The Town of Clarksville, Ky., received a novel, and very practical, Christmas present recently. The first of two bids for a storm sewer was $900. The second, from Edgar H. Hughes Construction Co. of Jeffersonville, Ky., was exactly one cent, plus a handwritten "Merry Christmas to the Town of Clarksville." Needless to say, Clarksville accepted the Hughes offer.

CONFUSION IN THE HINTERLANDS—While the Eisenhower Administration takes its hard look at partnership policy in resources (see also page 19), at least one local sponsor is caught between the proverbial frying pan and fire. Klickitat County PUD, which has a proposal in for John Day Dam on the Columbia River, recently commented that it was surrounded by an almost solid Congressional delegation from the Pacific Northwest favoring federal power development and a national Administration committed to partnership and is waiting to see which way the wind blows. Anyhow, admitted the PUD, rising interest rates have dulled its enthusiasm for the $273-million project.

SUEZ SPURS ATOMIC POWER—As a direct result of the Suez crisis and its effect on oil shipments, Great Britain made known this week a decision to double its original 2 million kw by 1965 atomic power program. Instead of ten plants, 15 now will be built and individual station capabilities are to be increased, some to more than 500,000 kw. And a few of the stations are to use a more advanced type reactor than the bulky, but practical, Calder Hall type (ENR Oct. 25, p. 48).

TO MAKE IT UNANIMOUS—A committee of Montana engineers will ask the legislature that convenes in January for an engineers' registration law. It would make Montana the 48th State to have such a law.



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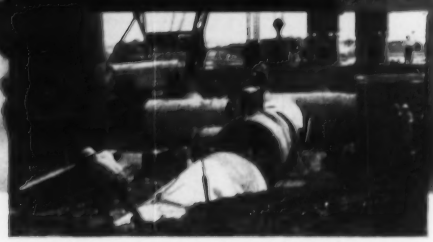

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WASHINGTON OBSERVER

Greatly accelerated building of an atom power industry is now just about a certainty. The only question undecided is: Whether private industry builds the plants; or whether the federal government does. That issue will be decided in Congress next year.

AEC Chairman Strauss' announcement of an Administration program last week added new emphasis. And the immediate reaction of Congressional Democrats, generally dissatisfied and even suspicious of Strauss' announcement, adds ample proof that a program similar to the federal highway program—but in millions not billions—is not far off.

•

Strauss wants five new reactors built by 1962. He is giving industry first crack at doing the job, but warns that unless there is a guarantee the plants could be built by the deadline, then some kind of federal participation, and even building, would be recommended.

Democrats in Congress will push anew for a federal program along the lines of the $400-million authorization proposed by Sen. Albert Gore (D. Tenn.) last year. The issue will be drawn at the formal hearings before the Joint Committee on Atomic Energy, beginning in February.

The American Public Power Assn. this week came out for a federal program, with preference, of course, to public bodies for getting the electricity.

•

The Administration is preparing to fight a renewed Congressional proposal to create a three-man commission to run the new highway program. Sen. Albert Gore (D. Tenn.) will revive his plan to estsblish the commission, outside the Dept. of Commerce. Last year, his proposal was modified, and a one-man highway administrator was created, instead.

Some Administration opponents are charging the highway program is going too slow, and will support Gore. The Administration, in turn, is pushing hard to make a record that the one-man administrator is sufficient.

Bertram D. Tallamy, New York turnpike director will become Federal Highway Administrator next month, already is keeping in close contact with Washington, and has conferred with state highway officials.

John A. Volpe, the interim administrator, is putting in full time on the job, and Administration officials will point to results in opposing Gore.

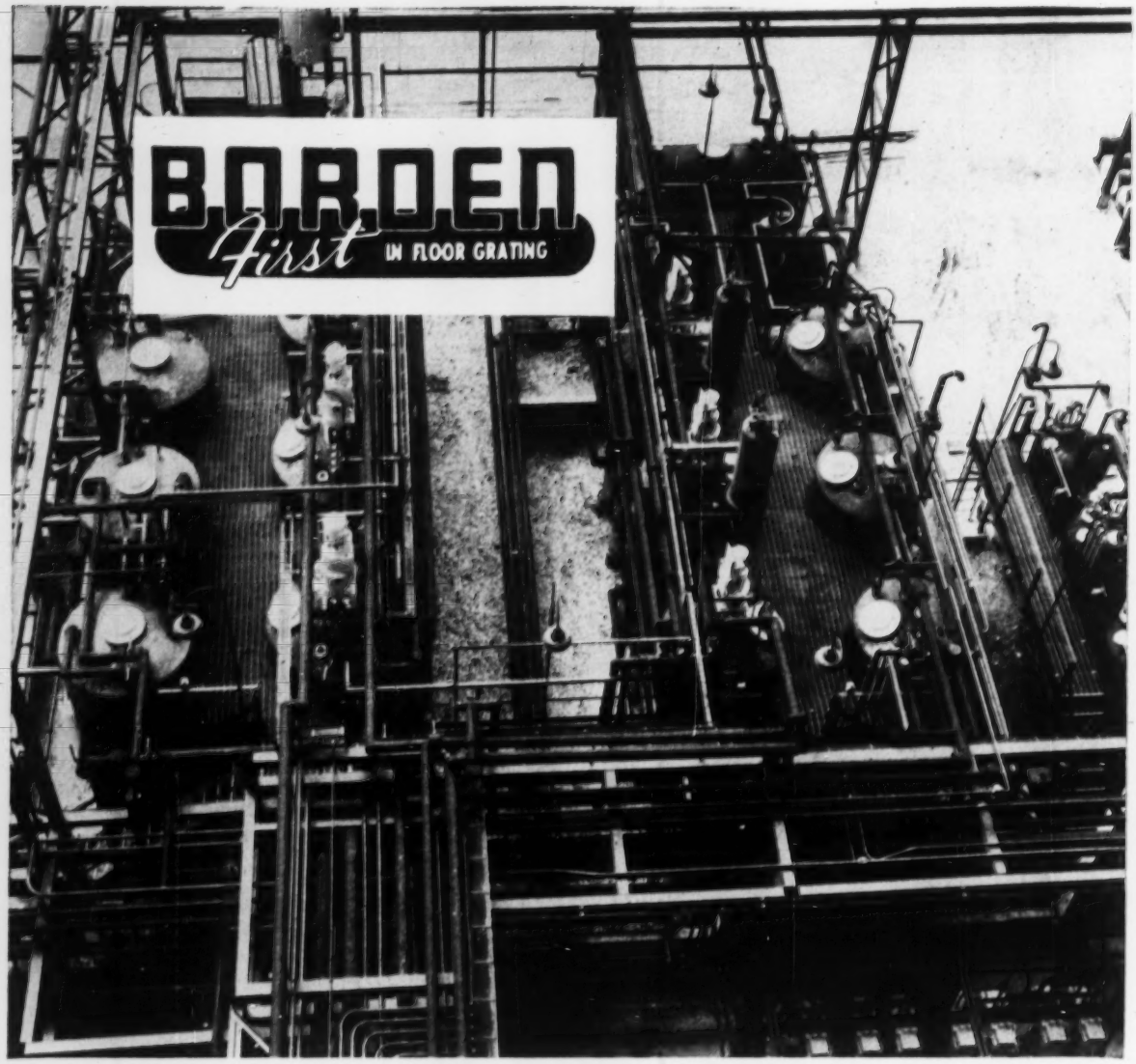
•

The continuing drought is prompting talk of a huge water development program that would dwarf present-day reclamation expenditures. The sponsors are, primarily, Democrats from the Southwest drought areas, particularly Texas, Oklahoma, Missouri and New Mexico. They have the ear of Senate Majority Leader Lyndon Johnson (D. Tex.).

The program, covering small dam construction, transporting of water to arid areas, and even salt water purification, is being worked on now. The basic facts for the idea come from a Bureau of Reclamation report made some years ago for Johnson and other drought-state congressmen. Look for President Eisenhower to suggest a drought program in January; then look for the Democrats to react with their own dramatic plan.

•

A prediction on housing: The Administration will wait awhile to see what the 5% interest rate on FHA mortgages does to homebuilding. But if the slump isn't slowed, officials will propose lower down payments, and propose permitting settlement costs to be included in the insured mortgage.



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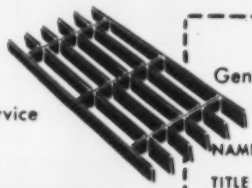

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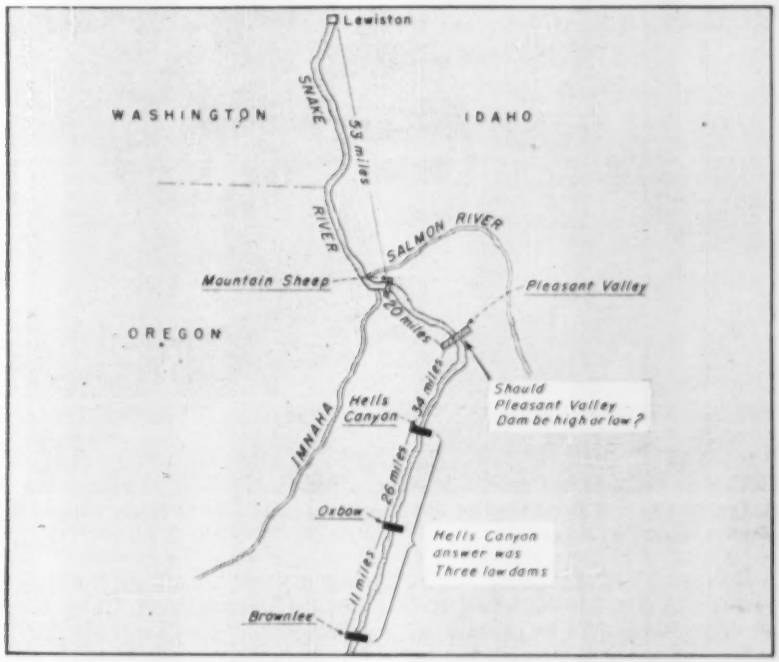
On the Snake River—

Another situation develops over whether a high or low dam should be built—and who should build it.



Pleasant Valley: Another Hells Canyon?

The next few months may see the words "high Pleasant Valley Dam" stir up as much heat in Washington as did the still convulsive Hells Canyon issue at its peak.

Proposed for location in the Pacific Northwest, land of explosive power controversies, the high Pleasant Valley Dam has all the elements of the Hells Canyon fight plus some new ones.

The Eisenhower Adminstration now seems almost sure to plump for the high Pleasant Valley Dam on the Snake River downstream from controversial Hells Canyon. An early decision is a strong probability, possibly in time for the President to indicate the direction of his thinking in the State of the Union Message Jan. 10.

The directions are many. The Adminstration could plump for an all-federal high dam, a partnership deal, or an all-private high dam development. Regardless of which, a fight between public and private power groups is almost sure to erupt over who gets the power—whether public "preference" groups or private utilities get first rights.

This week, the physical and political facts of the situation appear to be pushing the Adminstration inevitably toward a high dam—170 ft higher than the structure planned and presented by a Northwest utility group in a license application pending before the Federal Power Commission (picture and profile on next page). The suggested high dam would drown out the site for the farthest downstream of three dams already licensed for construction by the Idaho Power Co. in the Hells Canyon reach of the river. While work on the two upper dams has begun, but no construction schedule has been announced for the third and least productive unit.

The political and regulatory background of the situation is this:

For the past year the Federal Power Commission has been holding hearings on a license application for two low dams on the Snake River in Idaho from the Pacific Northwest Power Co. The group was jointly organized by Montana Power Co., Pacific Power & Light Co., Portland General Electric Co., and Washington Water Power Co. The dams it seeks to build are Mountain Sheep and Pleasant Valley.

Pleasant Valley, upstream from Mountain Sheep, would impound waters to the foot of the Hells Canyon Dam, one of three licensed by FPC to Idaho Power Co. The other two, working upstream, are Oxbow and Brownlee.

Now, though, Interior Secretary Fred A. Seaton is reviewing a Bureau of Reclamation study of the situation he ordered last September.

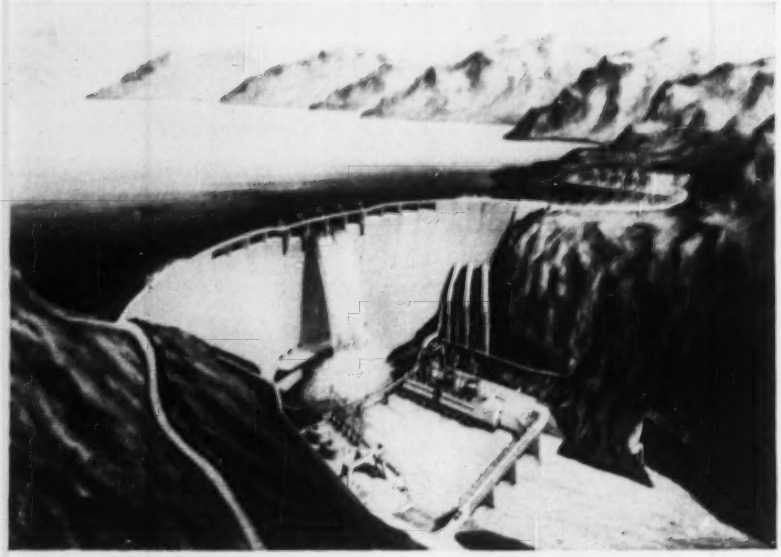
A battery of favorable facts is crowding the Administration toward a proponent position on a high dam for the Pleasant Valley site, 34 miles below the location of the discarded high Hells Canyon Dam and 25 miles above the Mouth of the Salmon River. This last river bears an appropriate name: It is a major spawning stream for the important West Coast commercial fish.

A decison by Seaton—action for the Administration—in favor of the high dam proposal would take effect in the form of Interior's intervening in this case, either with or without the support of the companies now applying to FPC for low dams.

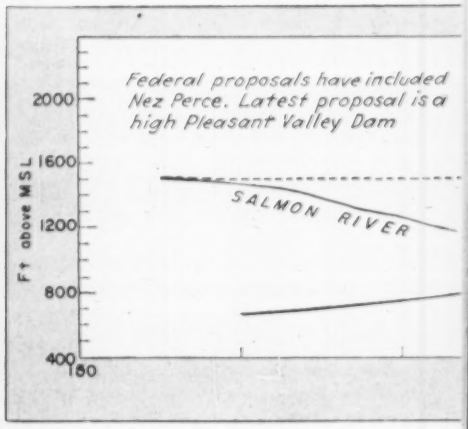
The politics of the situation is fairly simple—the Administration took political beatings in November in the Northwest area where power and resource development are key issues. The Democrats had spent much of the preceding four years attacking "give-aways," "partnership" and "Dixon-Yates"—and then succeeded in defeating Administration candidates Douglas McKay, Dan Thornton, and Arthur Langlie, all of whom were running for the Senate on the Eisenhower program and record.

Seaton, who has a reputation for be-

. . . Federal dam—private dam? High dam—low dam?



PLEASANT VALLEY DAM (low)—A 534-ft arch dam is the plan of Pacific Northwest Power Co.; license is now sought.



SITUATION—High Pleasant Valley Dam is

ing a skillful, up-and-coming "new Republican," obviously is looking for ways of improving the GOP chances in '58 and '60—and it's just such things as the Pleasant Valley situation that give him a chance to demonstrate that he's starting out afresh, not merely following McKay's policies. This will be Seaton's line—"taking a new look"—whether or not he gets behind the Pleasant Valley high dam.

Here are some of the advantages that argue for a high Pleasant Valley Dam, they are pointed up from two sources; a special Reclamation Bureau study for Interior Secretary Fred A. Seaton and in a letter from the Chief of Engineers, Maj. Gen. Emerson C. Itschner, answering questions asked by Sen. Robert S. Kerr of the Public Works Committee for Chairman James E. Murray of the Interior Committee.

I. Flood Control

Ranking high in the list of advantages for the high dam is the additional storage it would provide for flood control. This is one of the benefits sacrificed, for instance, in the plan now being carried out by Idaho Power's Hells Canyon projects.

The Pleasant Valley high dam would provide 1,300,000 acre-ft of useable flood-control storage, compared with 520,000 acre-ft that would be provided by the low dam that is presently being proposed.

Flood control for the entire Columbia Basin contemplated in the plan of the Army Engineers back in 1950 showed potential water storage totaling 21,000,000 acre-ft. This potential has been cut in half—less than 10,500,000 acre-ft is possible from the reservoirs in operation, under construction, and those under active consideration.

Hence, a high Pleasant Valley Dam would help here.

II. Power Potential

The power elements of the controversy are those that generate the most political heat, as was true of the Hells Canyon fight.

It's clear that the high dam would generate more power than the low dam now being applied for at FPC. Engineering figures available aren't precise, however, as to just how much more power it would produce.

The high Pleasant Valley Dam alone would produce—according to Bureau of Reclamation estimates—4.1-billion kwh per year at the site. The plan calls for generating power during the nine months from August through April, with the other three months being used to catch flood waters. Releases of water during the generating months would also increase the firm power output of downstream plants—Mountain Sheep and eight others in operation, under construction, or under consideration—by 890 million kwh per year.

Thus the high dam would produce an annual power increment of more than 5 billion kwh.

This compares with an annual firm power estimate by the utility combine for two dams—low Pleasant Valley plus the smaller Mountain Sheep structure—of 4.85-billion kwh per year.

As of now there is no figure on total power output from federal sources for high Pleasant Valley Dam plus Mountain Sheep. However, in a 1955 report of the Army Engineers to the Senate Public Works Committee, the Bureau of Reclamation estimated that the annual total, including the increment at downstream plants, would be in the range of 6.54-billion kwh.

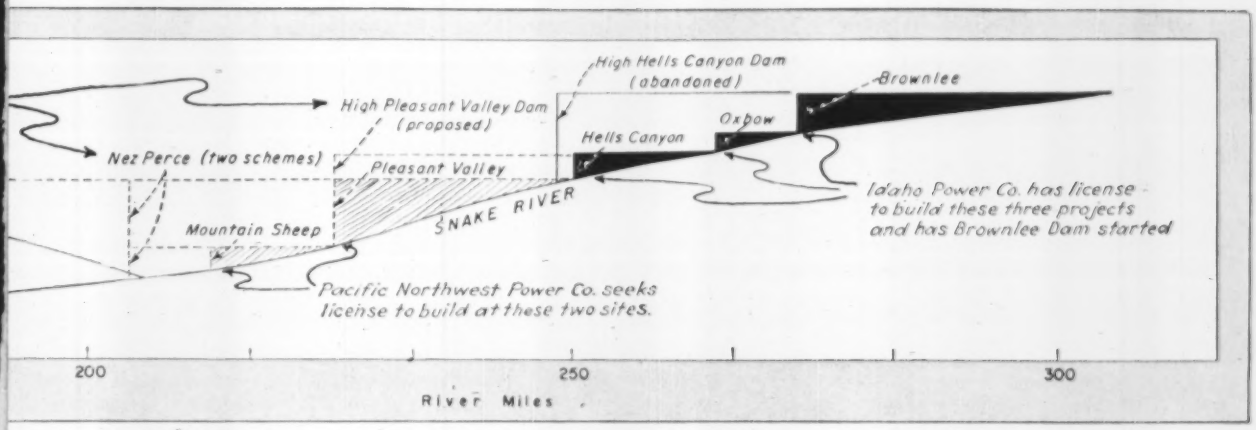
Obviously, the federal high dam plan tops opposing plans on power output.

III. Irrigation

Potential irrigation developments in the Columbia River Basin are dependent upon subsidies from power revenues. This is because irrigation users cannot afford to pay the price for water which would be needed to re-pay the cost of building the features needed to supply water to the land—tunnels, canals, and the like.

The dams proposed by private interests have no provision for irrigation—hence they have what amounts to a substantial political defect. Irrigation is important to the Westerners as another lever by which to build the economic importance of their area.

The federal high dam proposal would greatly increase the power revenues which then could be utilized to subsidize the irrigation works. Two years ago, the Reclamation Bureau estimated the net profit from power revenues available from a federally-built low Pleasant Valley Dam plus Mountain Sheep at some $20 million per year. This would make an irrigation of some-size economically possible. The high dam proposal—by increased power production and profit—would provide a substantially larger



proposed by the federal government, instead of Nez Perce. Plan would flood out low Hells Canyon Dam site.

sum for irrigation works, but an official estimate has not been published.

IV. Costs

The low dams being proposed by the power combine indicate a total cost of around $156 million for the dams and generating units; about $234 million in all, including transmission lines.

The utilities' 534-ft Pleasant Valley Dam would be a concrete arch of variable radius and thickness (see picture). It would cost about $100-million.

The six generators proposed for the low dam are larger than any in the world yet operating—49 ft in diameter, with a rated capacity of 144,000 kw and a maximum output of 170,000 kw each. Francis turbines would develop 233,600 hp each. Present record combinations are at Grand Coulee where generators are capable of 130,000 kw from turbines producing 175,000 hp (rated at 165,000 hp). The Russians, however, are building 200,000-kw generators at Bratsk Station in Siberia.

The dam would be the third highest true arch in the world, companies say (after Switzerland's 745-ft Mauvoisin Dam; and France's Tinges Dam).

Mountain Sheep Dam would be straight concrete gravity dam: structural height, 255 ft; cost around $56 million.

Bureau of Reclamation cost estimates of two years ago for two similar low dams are much higher than this—in fact, about double. Thus, they figured the Pleasant Valley low dam to cost about $200 million—and on the same basis, they say that the federal high dam now under consideration would come to about $275 million.

Reclamation so far isn't revealing even the basic elements it is considering for the high dam—although it almost surely would be of the arch type.

V. Politics

All this engineering information—and more that's obviously needed—will be hashed over in the months ahead, whether or not the Administration decides to favor the high dam. If Seaton decides to let the private companies go ahead, the Democrats will jump in just as hard as they did on Hells Canyon—this time they think they would stand a better chance.

If Seaton chooses to back the high dam, then he has to decide whether to go for an all-federal project—or whether to take the partnership approach allowing the utilities to finance the power generating equipment and have title to the power therefrom.

Officials of the utilities—some of whom were meeting with Seaton in Washington this week—might get behind a partnership proposal giving them the rights to the power from a high dam, even though this means cancelling out their application at FPC, and drowning out the Hells Canyon site of Idaho Power Company.

Reason: The high dam plan would produce more power, and—if they get it—it would be at less cost than the cost of building their own dams.

However, such a partnership plan runs into the red-hot political fight over giving "preference customers"—ie., municipalities and other public groups—first rights to the power generated at federal dams.

This is one of the issues Seaton has to consider—whether if he backs the federal dam, to support an all-federal project with the preference clause, or continue the "partnership" policy by permitting private companies to finance the power facilities and sell the power generated to their regular customers just as though it had originally come from a wholly-owned power source.

Seaton, however, could explore other ways of developing the site—suggesting that the power companies themselves build the high dam, for instance, without any federal participation at all.

Key Democrats regard all the fuss over Pleasant Valley as a diversionary tactic designed to divert public attention from the loss of flood-control benefits of the Hells Canyon high dam. They contend that Idaho Power Company's low dam plan has meant a sacrifice of nearly 3-million acre feet of flood water storage which can never be re-captured—unless the high dam at Hells Canyon is built.

Senator Morse, fresh from his victory over McKay, will re-introduce his bill to authorize the federal high dam at Hells Canyon.

KEY MAN—Interior Secretary Fred A. Seaton can raise another Hells Canyon storm, depending on his recommendation as to who should build in Pleasant Valley.

A Couple of Records

Memphis sells biggest city bond issue at highest rate

Memphis' ambitious plan to finance construction of a giant steam power plant to replace Tennessee Valley Authority energy has materialized.

Last week the city sold the largest issue of electric revenue bonds ever offered by a municipality—over $163 million—at one of the highest rates of interest in years, about 4.5%.

The money will be used for the first phase of the project, consisting of three 250,000-kw turbo-generators (ENR Nov. 22, p. 27). Another $123 million bond issue is slated to be sold later to provide an additional 750,000 kw by 1965.

The 750,000-kw plant, now under construction, is expected to go into service by June 1958. It was conceived to block the Dixon-Yates contract, in which the Eisenhower Administration had planned to bolster TVA power capacity by tying in with a private power syndicate.

In the face of apparent skepticism toward tollroad issues—which have declined steadily in price and buyer interest lately—reception of the long-awaited issue has been the subject of speculation. And its sale gave the sagging municipal bond market a boost.

With 454 investment firms throughout the country participating, the issue was made during the tightest point in a tight national money market. The result is that Memphis will have paid about $332.7 million, after final payment is made in 1992, for the plant and other installations. This amounts to some $169.5 million in interest during the period.

Memphis was literally caught in the squeeze. It had to raise the money but was caught in the middle of the tight money situation. When plans for the plant were drawn up last summer an interest rate of 3.5% was expected. After a trip to New York earlier in the week in an effort to drum up sale of the bonds at less than 4% proved a failure, city officials reluctantly put the issue up for bid.

The issue was sold to a syndicate headed by Salamon Brothers & Hutzler of New York.

Memphis offered $143 million in term bonds maturing in 1992 and $20 million in serial bonds maturing 1963 through 1982. The term bonds are callable in 10 years. This means that Memphis, finding the market better in 10 years, could issue other bonds at a reduced interest rate to pay off all of the term bonds, or any portion of them. To do so, however, the city would have to pay a "premium" of $50 on each $1,000 bond.

Placing concrete at 235 cu yd per hr . . .

30 Men Cast 1,500-Cu Yd Mat in 6½ Hr

One of the fastest continuous pours of concrete ever made for a building was executed without a hitch in New York City Dec. 8. In 6½ hr, 1,526 cu yd were placed by bucket and chute into the forms for a 5-ft thick, 8,200-sq ft foundation mat.

The huge double-reinforced slab will be the foundation of a 16-story unit of the Robert F. Wagner, Sr., Houses, a project of the New York City Housing Authority.

Casting began at 7:00 a.m. on the big day, a Saturday. The concrete plants had loaded the first trucks an hour earlier. George F. Driscoll Co. and Moccia Construction Co., joint-venture general contractors on the project, had scheduled the pour for a Saturday to make sure of getting the concrete supplier's entire output.

While a fleet of 24 truck agitators maintained a steady flow of concrete to the site from two plants of Ryan Ready Mixed Concrete Corp., the Driscoll-Moccia superintendent, James Thorkildsen, kept a 30-man crew loading the mix into the forms via two batteries of wood chutes and two cranes equipped with 2-cu yd laydown buckets.

Working in from opposite ends of the oblong excavation, where the chutes were located, both cranes and both groups of chutes were used until late morning, when the chutes had to drop out because the work had progressed out of their reach. The cranes continued to close in on the middle and finished the job at 1:30 p.m.

At a total cost of more than $14 million, Wagner Houses is the NYCHA's biggest project to date. Section 1, comprising seven 16-story and six 7-story buildings, is almost completely occupied. Section 2, under construction now, includes seven 16-story and two 7-story buildings.

None of the buildings completed so far is founded on mats. Foundation conditions vary considerably, however. Soil bearing capacity ranges from 3 to 8 tons per sq ft, and three units of Section 1 are supported on piles.

Architects for the job are Starrett & Van Vleck, with Reginald E. Marsh as associate. Consulting engineers are Seelye, Stevenson, Value & Knecht. Soils consultants to the NYCHA are Moran, Proctor, Mueser & Rutledge. John Gilman is project superintendent for the NYCHA, and Jack Jacoby is concrete superintendent.

State of Transition

North Carolina may double its contractors' taxes; will revise Highway Department

North Carolina contractors may have to dig twice as deep to pay their taxes in the near future.

A commission created by the 1955 session of the State Legislature to study the state tax structure and recommend revisions has suggested the present privilege license tax system be abolished. In its place, the tax group recommends a new occupational tax based on total gross receipts.

For contractors, both generals and subs, the commission recommends a maximum rate of one-tenth of 1% for state, city and county occupation tax levies.

The commission in its report estimates that annual gross revenues of construction contractors now total $600 million. Its proposed occupation tax of one-tenth of 1% would produce a tax revenue of $600,000 annually. Under the privilege license plan, which would be abolished, contractors paid $236,799 in taxes during the current fiscal year.

The tax group also recommends a change in the law that would classify asphalt plants as manufacturing plants, making the finished product subject to the state's 3% sales tax. Under current administrative practice, asphalt has been exempt from paying the state sales tax.

• **New road department setup**—But while the fate of the proposed tax revisions remains unknown, the State Highway Commission has approved a program that calls for sweeping changes in the administrative, organizational and accounting setup of the Highway Department.

Highway Chairman A. H. Graham and Chief Engineer H. W. Rogers have been instructed to integrate the proposed changes as rapidly as possible.

The changes—recommended by Haskins & Sells, Chicago certified public accountants—include a general reorganization of the headquarters staff and engineering departments, the creation of a new planning department and an arrangement to put both construction and planning on a statewide, rather than regional, basis.

Other changes will involve centralization of accounting and record keeping, payroll, inventory and budgetary affairs. A new controller's department (of which the present auditor's department will be but one of several divisions) will be set up in complete liaison with the State Budget Bureau so that every fiscal operation of the Highway Commission will be known to, and subject to the control of, the bureau.

Under the new setup, field personnel—particularly engineers—will have considerably less paper work than they now have. The State Highway Engineer, who now has one assistant, will have two—and neither will be merely an understudy. Both will have definite staff functions, one as an administrative assistant and the other as a federal contact officer.

At present, 13 engineering department heads and 14 division engineers are responsible directly to the State Highway Engineer. The new plan will reduce the number of departments to eight and ultimately will put all division engineers under the head of an expanded highway maintenance department.

The eight proposed departments are:

- Locating and design (with three subdivisions: locating, road design and traffic regulation).
- Highway construction (with three area construction engineers).
- Bridge construction.
- Roadway maintenance.
- Landscape.
- Laboratories (with two divisions—bituminous and materials).
- Equipment.
- Stores (a new department that will be responsible for all supplies and warehouse stores).

Wide World Photo

Wind Topples 1,200-Ft Television Tower

Gusty winds in Cedar Rapids, Iowa, Dec. 10 toppled what would have been the world's fourth highest tower. Under construction, the steel TV tower had reached 1,250 ft of its intended 1,358 ft when 55-mph gusts twisted an unguyed section at the top. The damaged section fell, hitting guy cables attached lower down, and flattened the entire tower. Officials of WMT-TV, owner, say the tower will be rebuilt.

Threat Ignored

Baltimore approves new tax though firms warn of curb in their expansion plans

The Baltimore City Council has passed a bill to tax manufacturing inventories and machinery, despite warnings from industry that the added tax burden would force them to curtail expansion plans (ENR Dec. 6, '56, p. 74).

The bill was signed by Mayor Thomas D'Alesandro and will take effect unless invalidated by court action.

Many industrialists in Baltimore contend that the new levy will slow the pace of industrial building in the city.

Municipal government officials argue, however, that Baltimore has other advantages to industry which nullify the impact of the tax.

Owners of real property, especially home owners, had been taxed to the limit, these officials said, and they felt the time had come to shift more of the tax burden to industry.

The current Baltimore tax rate of $3.13 will fall to $2.88 per $100 of assessed valuation next year because of the additional $13 million the city hopes to gain in tax revenues from industry.

Floods becoming more costly so group asks . . .

$10 Million for the Mississippi

A minimum appropriation of $70 million for Mississippi River control work during fiscal 1958 was recommended by the Mississippi Valley Flood Control Association at its recent 21st annual meeting in New Orleans. The association called for "a far greater degree of protection than now prevails" for the fast-growing lower Mississippi Valley.

Principal speaker at the closing sessions of the meeting was Maj. Gen. E. C. Itschner. The new Chief of Army Engineers noted that the succession of low water years in the Mississippi Basin "have demonstrated that one future fundamental must be an increasing emphasis on problems of low flow and of water supply."

But it must also be kept in mind, he cautioned, that ". . . every low water period is followed by a period of too much water." And although the present valley project will pass into the Gulf of Mexico somewhat more than the greatest flood on record, General Itschner pointed out that the greatest disasters have come from floods that broke all previous records. In some ways, he said, the Mississippi Valley is more vulnerable than ever—wealthier and better developed than ever, it also could suffer greater losses.

According to the general, "(at this time) . . . two things are required. One is to complete the Mississippi Valley review survey now under way, and the other is to continue to push ahead with construction of the authorized project." Review of the main stem program is scheduled to be completed by July 1, 1957, General Itschner said, and the entire Alluvial Valley study should be finished a year later.

"This survey," he continued, "will include a recomputation of the project flood, an analysis of the adequacy and benefits of the plan as now authorized, and, where necessary, recommendations for further work not yet authorized." Presently authorized work which must be continued amounts to some $450 million remaining to be done, he said.

Completion of control works at Old River, above Baton Rouge, to head off threatened diversion of the Mississippi River into the Atchafalaya Basin continues to be a primary concern. Completion date for the low-sill control structure is mid-July, 1959, said General Itchner. Contract has been let and work started on the overbank structure adjoining the low-sill structure to the north, and the navigation lock is expected to be completed in 1962.

The next general rivers and harbors bill will authorize $28 million for the lock, bringing the overall cost of the control project to $75 million.

Hyperbolic Paraboloid at Waikiki

Perfectly at home in its Polynesian setting, a thin-shell hyperbolic paraboloid roofs the lobby of the Waikikian Hotel, at Waikiki Beach, Hawaii. The warped shell is made of two layers of 1-in. tongue and groove plank—one fir, the other redwood—nailed to edge beams that have been laminated from 2x10's.

Diamond-shaped in plan, the 40x80-ft shell sweeps upward to a height of 42 ft at the tips of its 80-ft diagonal. Each of these corners is ornamented with a 1,500-lb. hand-carved prow of a Polynesian canoe. The other two corners curve downward and bear on concrete buttresses.

The project was designed by Wimberly & Cook, Honolulu architects. Richard R. Bradshaw was the structural engineer. The Hawaiian Dredging Co. was the general contractor.

Watchter to Become Hawaii's Public Works Superintendent

William W. Wachter, Dean of the College of Applied Science at the University of Hawaii, will leave his post Jan. 1 to become Territorial Superintendent of Public Works. He will succeed Ben E. Nutter, who has resigned to become chief engineer of the Oakland, Calif., Port Authority (ENR Dec. 13, 1956).

Wachter, currently on sabbatical leave from the university, has been serving as an engineering consultant in New York City.

As Hawaii public works superintendent Wachter also will serve ex-officio as chairman of the Board of Harbor Commissioners and Territorial Highway Engineer. He will take over supervision of a $50-million highway building program authorized this year, plus construction of a new $14-million Honolulu Airport terminal and runway realignment, and a new multi-million-dollar passenger terminal for Honolulu Harbor.

Legislature Urged to Enact An Underground Water Code

Wyoming State Engineer L. C. Bishop has asked the 1957 legislature to enact an underground water code and appoint a groundwater geologist as an assistant state engineer.

Bishop said Wyoming's present groundwater law established a priority system, "but there are no administrative provisions."

Bishop also asked legislation to enable the state engineer to delegate authority to one of his assistants to represent his office as interstate streams commissioner and advisor to the governor on the Columbia and Missouri Basin interagency committees.

Elevator Shaft Goes Up to Nowhere

At first glance the free-standing elevator shaft on the construction site of Watts Parking Garage in Miami, Fla., appears to be a case of putting the proverbial cart before the horse. The tower is already completed, weeks ahead of the six-story self-service garage it will serve.

Actually, the job is well timed, and both the tower and garage are right on schedule.

Engineers of Otis Elevator Co. had estimated that after the shaft was erected, it would take another 12 weeks to install two 1-ton capacity passenger elevators. (In this garage automobiles will be driven up ramps.) Ordinarily this time is needed also to complete walls and building finish. But in this case, there will be very little of either finishing or wall.

Above and below each slab at the perimeter, there will be a narrow band of wall, but most of each story will be open. And concrete surfaces won't be finished. Consequently, the building will be virtually completed as soon as the structural frame is erected.

The garage, therefore, would have been ready for business long before the elevators were installed if the contractor, M. R. Harrison Construction Co., Miami, had erected the shaft and the rest of the building at the same rate.

However, Harrison decided instead to give the elevator men a head start on their part of the project by erecting the shaft as soon as the foundations were completed.

His men cast the 8-in. reinforced concrete walls of the shaft on the ground, in sections with steel angles embedded along the edges. Also embedded were inserts for a steel ladder and elevator guide rails. Then they raised and plumbed the sections and welded the steel edges together. Finally they hoisted the precast concrete floor slab of the machine room to the top of the shaft, built concrete-block walls on the slab, and capped the walls with a precast roof slab.

Now the elevators are expected to be running as soon as the building is ready.

"Wet" Northern Californians Would Secede From the "Drys"

Disgruntled over the state's plan to transmit surplus northern California water to dry southern areas, a group of businessmen have asked eight northern counties to secede from California and set up a 49th state of "Shasta". With great flourish, the rebels dispatched a telegram to Rep. Clair Engle in Washington warning of "impending civil war based on the aggression of southern California regarding water."

If Texans similarly began feeling their oats over proposals to divert surplus east Texas water to the Gulf Coast, they would have a much easier time. For when Texas joined the United States it reserved to itself the right to form four separate states at any time it deemed that its best interests would be thus served.

It's the old "wet" vs. "dry" argument, with a new, non-alcoholic twist.

San Francisco Site Picked For Big Federal Building

A site near San Francisco's Civic Center has been selected for the $45-million federal building first announced by the government earlier this year.

General Services Administration estimates the project will be ready for bids in 12 to 14 months.

The 13-story office building, will provide 1.6 million sq ft of space.

The GSA will purchase the property and raze existing buildings.

Then, the government agency hopes to find private interests who will build the structure and lease it back to the government under a 25-year lease-purchase arrangement.

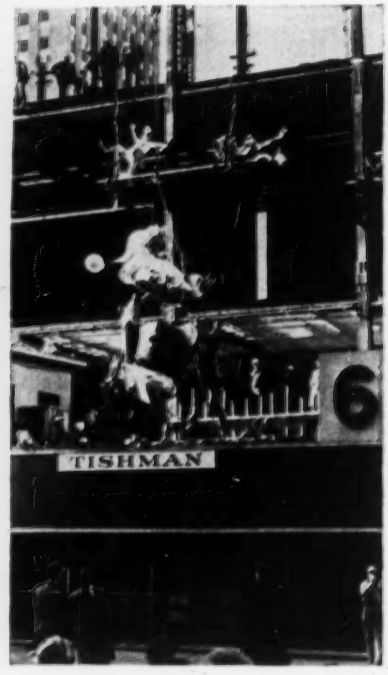
Efforts to find a developer have not yet started, according to the GSA. But, an architect for the project will be announced soon.

Texas Pushes Plan for State To Buy Water Project Bonds

Divergent groups in Texas are fast getting together on a proposed constitutional amendment that would promote a huge water development program in the state. The amendment would set up a $100-million revolving fund that would be used by the state to purchase bonds for water projects from cities, river authorities, conservation and reclamation districts whose credit is not good enough to sell on the open market.

Early this month the Texas Water Resources Committee approved a final version of the proposed legislation and is huddling with Governor-elect Price Daniel to obtain his complete concurrence. There now seems to be little opposition to the basic scheme.

NEATNESS in design, painting and signing characterize a sidewalk protection bridge around a new office building under construction on New York's Fifth Avenue.



ASSEMBLING SANTA CLAUS and his helpers in a Christmas display.

Sidewalk Bridge Promotes Good Will

Straddling a sidewalk on Fifth Ave. in the heart of New York City's famed shopping district, a construction bridge for a 38-story, air-conditioned office building is drawing the eyes of shoppers away from the store windows. Center of attraction is a 15-ft high papier mache figure of Santa Claus astride the safety bridge.

This is the means Tishman Realty & Construction Co., owner-builder of the structure at 666 Fifth Ave., is using to convey Yuletide greetings to the public.

But the Christmas display is only one phase of a continuous program in which the sidewalk bridge is employed to advantage to build up good will while the building is under construction.

• **Bridge spruced up**—As a member of the Fifth Avenue Association pledged to maintain the dignity and beauty of the thoroughfare on which the building fronts, Tishman has endeavored to make an ordinary sidewalk bridge into an attractive-looking structure. The firm added a neat fascia along the outside of the deck, which extends 200 ft along Fifth Ave. and about 300 ft into 52nd and 53rd St. And it went to some pains to give the subcontractors' offices on the bridge a cleancut, efficient appearance.

As a final touch it gave these two components coats of paint in contrasting colors.

Last summer, Tishman brightened up the parapet of the bridge with 250 boxes of geraniums and ivy and assigned a maintenance man to water the plants twice a week. They will be replaced by artificial flowers this winter after the Christmas display is removed.

A few weeks ago, Tishman added another noteworthy attention-getter when it installed several three-dimensional viewers in the fence along the Fifth Ave. frontage.

Set at various heights to accommodate sidewalk superintendents of different sizes, the viewers display a 3-D color picture of a scale model showing how the building will look when completed next October. (About one-third of the bolted steel frame has been erected to date.)

Also on display—facing Fifth Ave. on the roof of a bridge office—is a sample of the unusual panel that will form the building's facade. Fabricated of anodized aluminum, the panel is embossed with small squares (ENR Nov. 22, p. 29).

Early this month, the 900-lb Santa Claus was set on the safety bridge, and five of his helpers, dressed like construction men, were perched on the steel frame.

Santa was given a blueprint to study, and the 6-ft tall "gnomes" were equipped with tools.

• **Basic bridge construction**—Chesebro-Whitman Co., Long Island City, N. Y., erected the bridge, a patented structure, which was designed to carry a 300-psf load.

The deck consists of a 2-in. thick plank floor supported on 6-in. I-beams and 8-in. steel header beams.

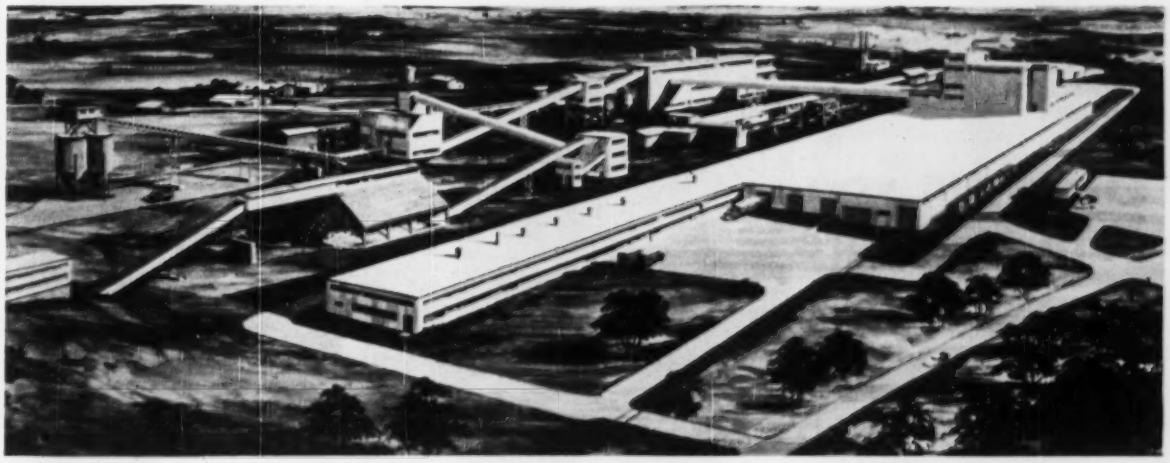
These, in turn, are carried on 4½-in. O.D. steel pipe columns, spaced 7½ ft c-c, which are seated on two 3x10-in. timber sills laid on the existing concrete sidewalk.

Clear height for pedestrians under the bridge is 9 ft. Truck entrances have at least 14 ft clearance.

A battery of spotlights keeps St. Nick and his men well illuminated at night. But under the bridge, artificial lighting—which could do a great deal to improve public relations—is provided at the ordinary minimum.

The subcontractors' offices on the bridge, erected by Robert Cartino, carpentry subcontractor, are of wood-frame construction, with plasterboard walls inside, plywood outside. Floors are asphalt tile.

One office has steel partitions, and all have warm-air heating. Toilets also are provided.



Barber-Greene installation at new Celotex plant. Ten of the eleven conveyors are housed. Building at far left houses primary crushers. At right is wallboard plant. Mill is in background.

(Left). Material rejected by the separator is carried to two storage bins by this 329-foot Barber-Greene conveyor. Standard 60-inch truss minimizes the number of supports required. (Right). A 422-foot conveyor in gallery utilizes traveling tripper to build long stockpiles.

1600′ conveyor system serves new Celotex plant

Eleven Barber-Greene conveyors are incorporated in the design of a new plant of the Celotex Corporation.

The 1600-foot conveyor system handles every product from the raw, heavy gypsum rock to the fine finished plaster. This processing requires a wide variety of types and sizes of conveyors—all coordinated to deliver continuous high capacity at lowest operating cost.

Built with *standardized* components, these versatile conveyors are delivered faster, go up easier and require less costly engineering time.

These pre-engineered components can be used in almost limitless combinations, from the most complex systems right down to the small setups requiring a single conveyor. When it comes to adapting Barber-Greene conveyors to meet changing needs, standardized components make the job easier, faster and more economical.

Write for literature on the conveyors pre-engineered to cut costs

56-23-PE

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

How will you apply tractors for next year's roadbuilding?

In your *pioneering tractor fleet* you will find that there is a place for the advantage of speed and mobility of Tournatractor, as well as for the advantage of extra low-speed drawbar of crawlers.

If you will give a little thought to your pioneering tractor operations, you will realize that they involve a considerable percentage of light clearing; a lot of shallow cuts for access, detour and haul-road construction, considerable fast work on temporary drainage for keeping work-areas dry, together with frequent movement of equipment.

pioneering

By dividing the pioneering assignments, you can use crawlers where you get an advantage from their extra traction which provides a plus in drawbar at speeds of 1 to 1½ miles per hour. You can use the faster, more versatile Tournatractors to speed the lighter clearing and grading together with the hit-and-run assignments. Teaming advantages of crawler with those of rubber will give you a considerable overall saving in time and expense.

Studies indicate that, on most jobs, Tournatractor makes the best buy for 25 to 50% of the pioneering fleet applications.

Next, check your *fill-tractor operation*. Have you ever made a time study to show just what your fill tractors are doing? If not, it might be a good thing for you to get a check on just what these tractors are doing over a period of at least a week. We believe this will show some rather interesting, and perhaps surprising, things about just where your money goes on the fill operation. On most jobs, we think your studies will show there is no work on the fill that requires the plus of crawler traction and the resulting lugging advantage of a slow-speed drawbar rating.

filling

As to soft going, remember that Tournatractor can work on spreading and compaction effectively whenever you have dirt that is acceptable for fill construction. Remember, too, that, when working on compaction, Tournatractor puts a 20-ton roller in front of your 50-ton compactor for a big advantage that doesn't cost you an extra dime.

Then, we believe your time-study will also show that there is a surprising lot of emergency dozing where you borrow a fill-tractor to help out on a trouble-spot here and there on the right-of-way. Certainly, these off-the-fill assignments call for at least one fill tractor that can

run! A fill tractor usually gets these emergency assignments because you can borrow it for an hour or so without delaying your production. With a 17 mph rubber-tired tractor, you can get to these emergency jobs faster, do them quicker, and get back in half the time.

Also, give consideration to the compaction characteristics of those big, low-pressure tires as they spread the fill. This valuable plus saves more of your roller time.

Make your own studies and check our claims. We are, of course, prejudiced, but we think you'll find you can save money by using rubber for over half of your fill tractor assignments.

Now let's *look at the cut*. Our 416 hp Twin-C Pusher is, of course, our recommendation for push-loading scrapers in the 18 to 25-yd. class on volume earthmoving. But, for push-loading in hard digging materials on smaller jobs, we'd say most of your present crawlers in the 200 hp class are your best bet. However, on the big yardage jobs where you're working a number of pushers in a cut or operating more than one scraper fleet at a time, we would recommend that you have one or two Tournatractors in your pusher fleet. This makes it easy to balance long and short haul operations by transferring the high-speed, rubber-tired units as needed to keep your scrapers moving pay-dirt at maximum efficiency.

pushing

As you check time-study cycles with Tournatractors pushing, you'll find, too, that Tournatractor's speed and instant gear-change has advantages in performance not readily apparent. They may require a lighter scraper cut and an extra 10 to 20% in distance to load, but you'll find, in most materials, they still match crawler pushers in loading time. They also are usually faster on return, and, after the operator gets familiar with them, can save time in positioning. By and large, however, their big advantage for pushing service is in providing a flexible pusher fleet ready to adjust to job requirement, 2 or 3 times a day if necessary, with loss of time for moving measured in only a few minutes. With alert supervision, and intercommunication system between spreads, this can be very important.

finishing

When you study your *final clean-up-and-finishing* work problems, we think you'll readily agree that this application is another place where speed and mobility are the two prime requisites of profitable performance. Compaction advantages of big, low-pressure tires are an asset. These do not rough up the finish grade as do crawler grousers. Range of work area is often large and well adapted to speed application. Movement along the right-of-way is extensive and high travel speeds are needed for turning out maximum work at lowest cost. Once you've tried Tournatractor on this finishing work, you'll rate it tops for production and profit.

With both crawlers and rubber on the job, you'll find good supervision can easily assign each to the duties where its individual advantages make you the most money. You've a place for crawlers and a place for rubber . . . worked as a team, they meet the new problems of earthmoving for profit in your present and your future operations.

Tournatractor—Trademark Reg. U.S. Pat. Off. CT-1185-G

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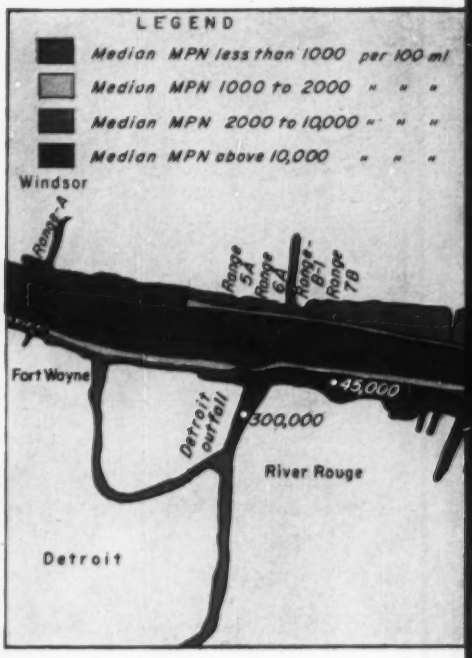
A Subsidiary of Westinghouse Air Brake Company

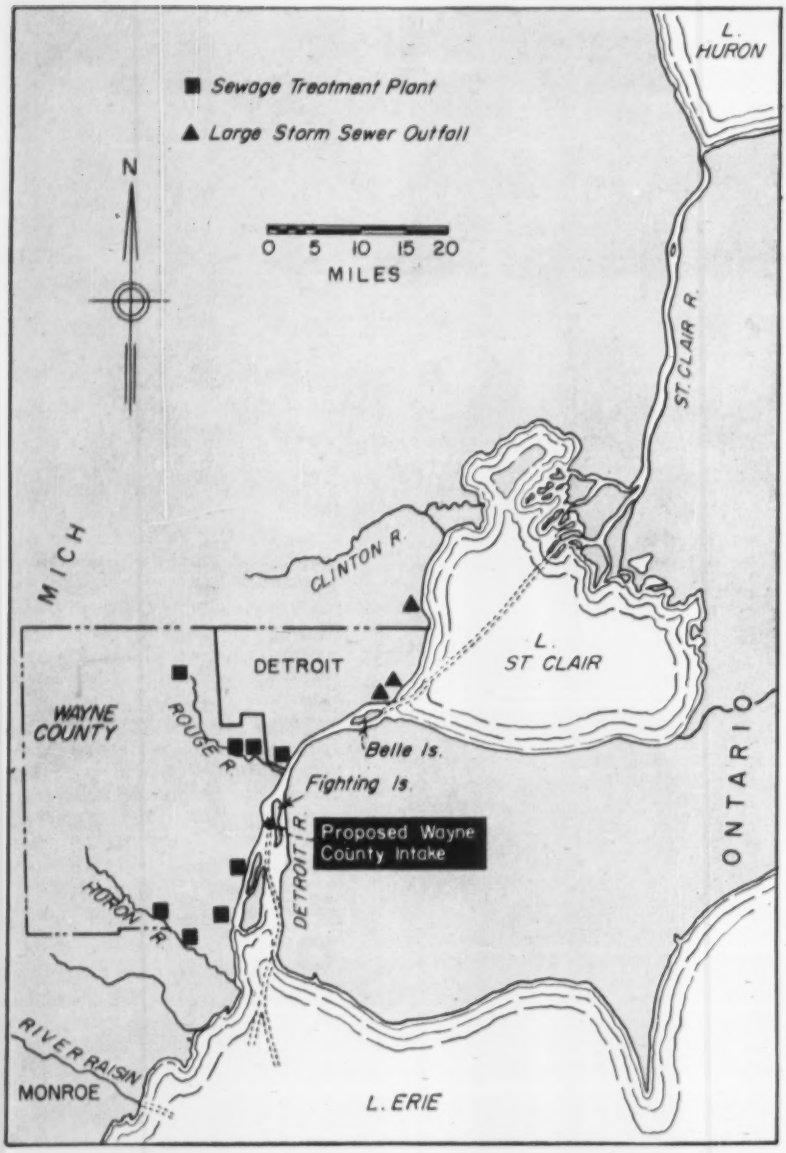
ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Midstream in the Detroit River . . .

water is of consistently high quality, shielded from heavy shore pollution by the river's stratified flow. Backed by comprehensive data such as the coliform density map at right, Wayne County, Mich., is going ahead with a 450-mgd water supply intake in mid-river below several major sewage outfalls.





INVESTIGATION shows water quality at proposed intake as good as at Belle Island, location of Detroit's intake. Only reliable upland water is in Lake Huron.

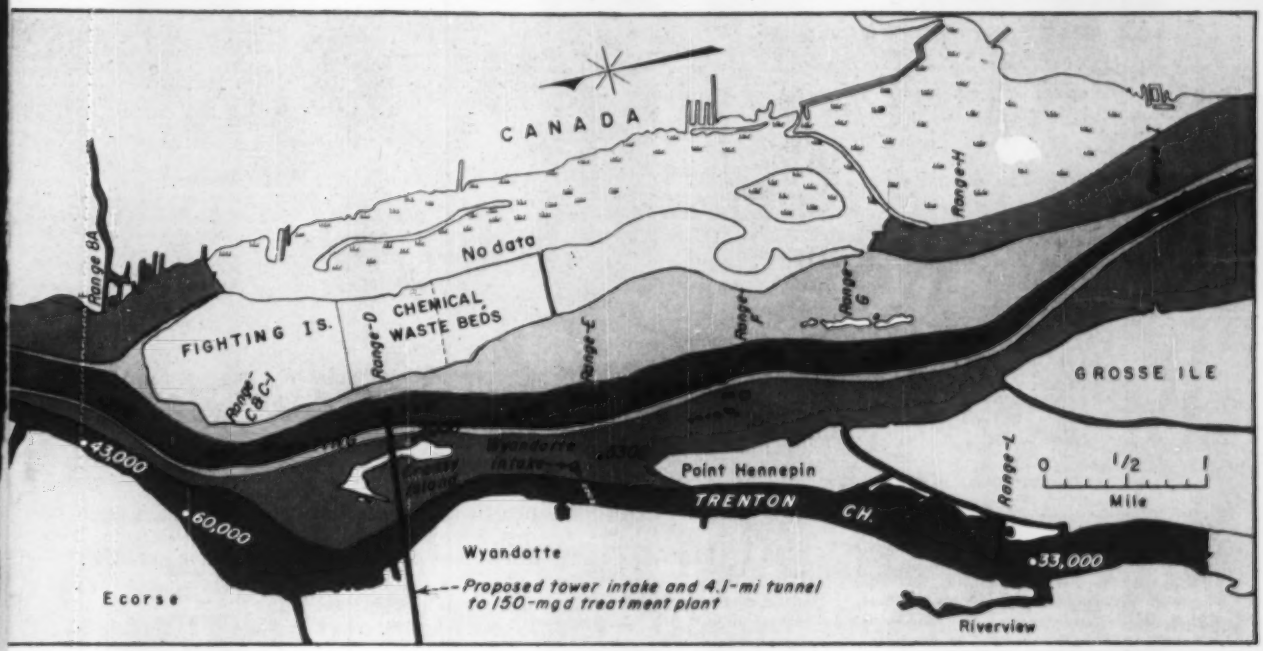
Near Detroit,

Wayne County, Mich., recently made the big decision to develop its own water supply rather than continue to buy from the City of Detroit. Forced by the economic facts of life to develop a nearby source, Wayne County is turning to the lower Detroit River, sometimes characterized as the "sewer for Detroit". That this can be done in good conscience is due to an outstanding engineering study, by the New York consulting firm of Hazen & Sawyer, showing that Detroit River flow characteristics effectively shield the mid-river water from shore pollution.

Final designs are now being prepared for a tower intake in the middle of the Detroit River, a four-mi transmission tunnel good for 450 mgd (ultimate requirement) and low-lift pumps, treatment plant and high-lift pumps of 150 mgd capacity—all to cost $35 million. Land acquisition, engineering and $10 million of distribution system will bring the project cost to $50 million.

• **Need for water**—The Wayne County area downriver from Detroit expects a large influx of heavy industry, attracted by low-cost water transportation through the St. Lawrence Seaway and the unlimited availability of industrial water. It behooves the county to plan large and well for a satisfactory water supply.

At present, the city of Detroit supplies most of Wayne County, either directly or through the county water system. In recent years, water use has



Clean Water Is Where You Find It

been restricted during summer months and Detroit has even forbade extension of water mains in some instances. In January 1955, Detroit served notice that Wayne County must develop its own supply by 1970, thus instigating the present project. But in June of this year, Detroit, apparently with its eye on obtaining phenol-free water from Lake Huron eventually, offered to provide water to the county indefinitely (ENR June 28, p. 26).

A politics-clouded city-county situation caused Wayne County to reject the offer, with its spokesmen stating that Detroit offered water at $100 per mg while the county could provide its own at $55. City officials have put the county cost as high as $300. Judging from preliminary estimates of operating costs given in the consultant's report, water from the proposed Wayne County works will be produced at approximately $180 per mg in 1960, $95 by 1980, with further decrease in unit cost by 2000.

Under the county plan, Detroit will continue to supply a portion of the water, to those areas too interconnected to the city's distribution to permit separation at reasonable cost. Population, per capita consumption and total water requirements were estimated by the consultants as shown in the accompanying table. While the estimates were carried to year 2000, planning was for a 450-mgd source, enough to supply an ultimate population of 1.5 million, extending into adjacent counties, with a 175-gcd average consumption and peak daily requirements 170% of average (200% was assumed through 2000 in the table).

The choice of a source narrowed down quickly enough. Lake Huron, offering "upland" type water that would remain relatively unaffected by pollution loads but which required filtering, was financially out of the question for Wayne County alone. The St. Clair River, almost as distant as Lake Huron, and Lake St. Clair offers water of little better quality than that of Detroit's River intake at Belle Island. The consultant's investigative scope was limited to the Detroit River or the western end of Lake Erie. The tough question facing Hazen & Sawyer was to determine the quality of Detroit River water, both now and in the future.

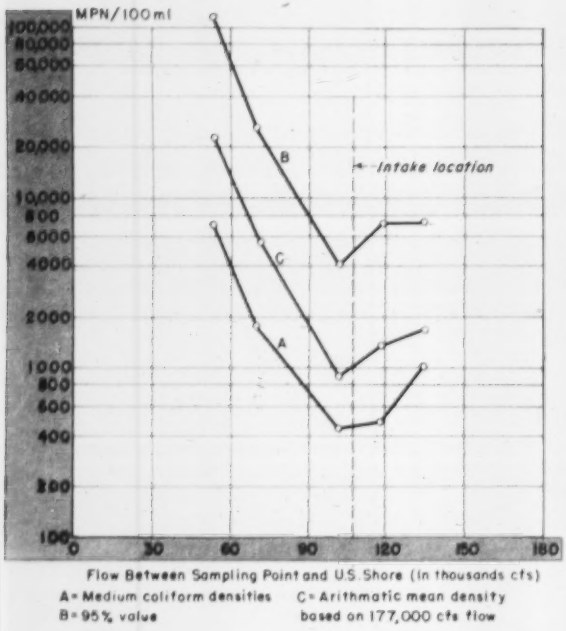
• **The investigation**—The Detroit River flows 31 miles from Lake St. Clair to Lake Erie, dropping 2.8 ft. The river flows swiftly and amply in a 26-ft-deep channel, with currents varying from 3 to 6 fps and flow from 148,000 to 227,000 cfs, averaging 177,000 cfs at the proposed intake. But most important is the uniform cross section of the upper part of the river which contributes vitally to the absence of cross currents in the river. This persistently streamlined flow is often demonstrated by the appearance of silt streaks after channel dredging operations, which are arranged to not affect the normal regimen of the river. The studies centered on determining effectiveness of the littoral stratification in protecting mid-river in the lower portion of the Detroit River.

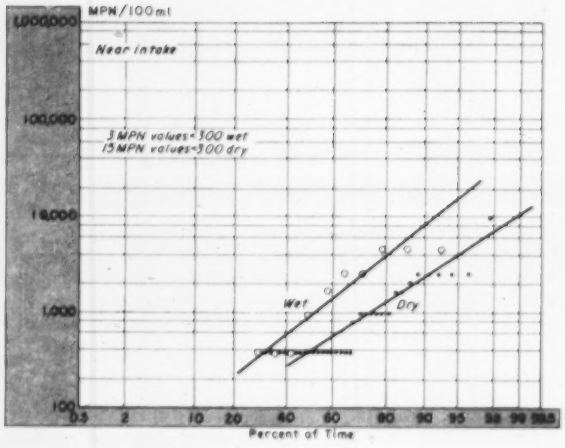
To a goodly mass of data assembled previously by such agencies as the International Joint Commission and the Detroit Water Board, Wayne County, at the request of Hazen & Sawyer, added 6,000 bacteriological and 8,500 chemical determinations from 5,000 samples taken between April and November, 1955, from the river and Lake Erie. Unfortunately adverse weather and ice conditions precluded extensive sampling during winter. However, available year-round data have established that although taste problems due to phenolic compounds are more prevalent in winter, bacterial quality is better.

Samples were taken in Lake Erie and at the various ranges indicated in the accompanying drawing, spaced from the U. S. shore most of the way across to the Canadian side. Analyses were made for coliform density, plankton counts, chloride concentration, and other important chemical characteristics. The recently developed arithmetic mean density (AMD) was used in addition to median and 95% densities in evaluating data.

Almost all samples were taken 1 to 2 ft below the surface; some 20-ft sam-

. . . Clean water is where you find it





COLIFORM DENSITIES plotted across river at intake site (Range D) show mid-river water some 150 times better than along the shore (left). Plot of coliform densities of wet- and dry-weather samples across Range D shows similar distribution of coliform density values across lower Detroit River.

ples at potential intake sites and other representative points indicated no difference in bacterial quality. Recent 1956 data substantiate this.

• **The results**—Some of the most significant results are shown in the accompanying graphs. They establish for decision-making purposes the existence of good water in the center of the river. Median coliform density at the low point ranges between 100 and 300 MPN (most probable number) per 100 ml, while averaging 50,000 at the American shore. In other words, mid-river water is generally 150 times better than water along the shore and exceeds raw water standards of the U.S. Public Health Service.

Similar profiles were drawn for other years back to 1942 and the pattern and ranges remained consistent. The median profiles also show that intake site is shielded from U. S. shore pollution by flows of 40,000 to 60,000 cfs.

The shaded map with low coliform densities noted for various points indicates only a slight decline in the bacterial quality of mid-river passing downstream. But most important, it shows, in the words of Hazen & Sawyer, that "characterization of the lower Detroit River as the sewer for metropolitan Detroit is not warranted. The Trenton channel does serve this purpose, but the quality of the main flow of the river is affected only to a slight degree."

Although median densities increase down-river, 95% coliform values show little change from Ft. Wayne to the lower end of Fighting Island.

A shaded map for chloride concentrations is strikingly similar to the one illustrated for coliform densities. Mid-river water had average concentrations between 6 and 10 ppm extending from Range A to Range G. Below River Rouge along the shore, they ran up to 42 ppm.

The difference between wet- and dry-weather samples is also striking in that coliform densities near shore increase to a much greater extent than in mid-river. Near the chosen Grassy Island intake site, the median density western sampling point increases nine times in wet weather compared to only two times in midstream. The consultants thus concluded that although pollution in mid-river is slightly greater following rains, it does not make its way across the river in concentrated slugs.

A chemical analysis of water resulting from the 1955 sampling program is shown in an accompanying table. In addition, during winter, turbidities at Belle Island, the city of Detroit's intake site, have reached 180 ppm. Similarly, International Joint Commission data collected in 1947 show phenol maxima at 40 ppb.

Bottom samples proved that intake sites are free from mud and sludge deposits that might cause difficulty if bottom water were drawn.

• **Future patterns**—While it is apparent that existing water at the planned Wayne County intake is of satisfactory quality, the effect of growth measured in terms of pollution is a paramount consideration. The consultants recognize clearly that no water supply from the Detroit River will remain satisfactory unless upstream pollution is controlled. However, the steps needed are not thought to be unreasonable.

The chief sources of pollution are raw sewage discharged into the St. Clair River, combined sewer overflows into Lake St. Clair and into the Detroit River, effluent from sewage treatment plants at River Rouge and Dearborn, raw sewage discharged into the Detroit River from Canadian communities, dredging operations in the Detroit

Analysis Near Intake

(avg values in ppm)

Chlorides	8.0
Turbidity	8.6
Alkalinity	84
Hardness	98
Phenol	0**
Cyanides	0*
Chromium	0
Ammonia	0**

*Traces at other sampling points
**Traces

Population, Consumption Estimates

Year	Population served	Average Consumption (gcd)	Average Demand (mgd)	Maximum Daily Demand (mgd)	Total Population Wayne County
1960	345,000	125	43	86	565,000
1970	485,000	150	73	146	785,000
1980	610,000	165	100	200	935,000
1990	735,000	170	125	250	1,070,000
2000	820,000	175	144	288	1,190,000

Hilly 650-acre site in Denver graded for 2400-home subdivision

Denver, Colorado, does things in a big way! Among the big construction jobs undertaken recently in the greater Denver area is the Hutchinson Homes project, covering 650 acres — site of 2400 future homes.

The job of preparing these home sites, and building necessary streets, was taken by McMillan Construction Company, Englewood, Colorado. The area of this residential development consists of rolling hills. Grades on the cut and fill range from 7% to 24%. Materials to be moved are heavy black topsoil . . . with a mixture of shale and rock as subsoil.

Use 4 D's, 2 C's, on 2-yr. project

To handle the necessary land-leveling and roadbuilding, McMillan turned to its four 7-yd. D and two 16-yd. C Tournapulls for the major dirtmoving. Also used are 4 trenchers, 3 crawler tractors, 1 wobble-wheel roller and 1 motor grader. Work on the project was begun in May, 1955, and will probably continue until July '57.

First step was to divide the 650 acres into smaller working sections. Each area, or plat, is then treated as a complete job in itself. Tournapulls went right to work removing and stockpiling topsoil. Next step was to cut down hills, and fill in valleys. (Deepest cuts and fills on the job run to about 15'.)

Units working on 5800' cycles

Push-loaded with 4½ to 5 pay yds. of rock and shale subsoil, each "D" completes 5800' cycles in an average of 6¾ minutes. The bigger "C's", on the same cycle, carry 10 pay-yards of high void shale in an average 7¾ minutes. Working 2 shifts, total daily production is about 4800 cubic yards.

"D's" turn in 13' radius

On the day photographs were taken, Tournapulls were cutting down a hill. Good topsoil was being spread on a stockpile . . . while shale material was dumped into a valley area nearby. Later — because of their unusual maneuverability, which permits rig to turn in a space only 26' wide — "D's" will be assigned to spread and grade topsoil around completed homes.

Supt. Jay A. Pettitt said, "I like the maneuverability of Tournapulls. You can hardly get them stuck. They load fast, too." Operator Connie E. Stayton added, "These Tournapulls are easy to operate. We have very little downtime with them."

McMillan also enjoyed unusual flexibility of operation with his 6-rig mixed fleet of C and D Tournapulls. By splitting the fleet — where conditions indicated — he could always work the *most effective combination* of scrapers to handle every job.

Get all the facts

See for yourself what modern LeTourneau-Westinghouse equipment can do for *you* on all types of dirt-moving assignments. Figure your profit potential with new, bigger, lower, easier-loading Tournapulls. New heaped capacities: "C" — 18-yd.; "D" — 9-yd. The improved "D" is now only 8-ft. wide, and within 9-ton axle-load limit to allow roading without permit. Send for complete details.

Tournapull—Trademark Reg. U.S. Pat. Off.
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On topsoil stockpiling operations in Denver, Tournapulls climb 150' of 10% adverse grade . . . return down 24% favorable slope.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

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In addition to replacing several piles with one belled caisson thereby eliminating a pile cap, belled caissons are replacing spread footings on more and more jobs because of the economies and the speed up of the job.

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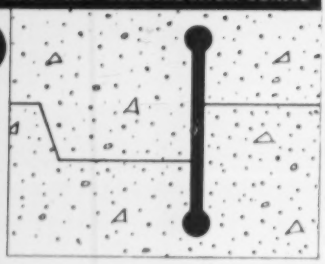
FOR MASONRY CONSTRUCTION JOINTS



Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

WILLIAMS
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17928 Kinross, Birmingham, Michigan

River and phenolic and toxic wastes from industries discharged into the St. Clair River, Lake St. Clair, River Rouge and the Detroit River.

The consultants believe the greatest hazard to satisfactory water supply will stem from industrial wastes—particularly phenols – discharged into and above Lake St. Clair. Lake St. Clair waters tend to spread across the lake so pollution therein has greater effect in Detroit River midstream waters than does pollution from downstream sources.

Downstream, the city of Detroit and immediately adjacent areas are substantially built up, so frequency and magnitude of combined sewer overflows will not increase much. Most of the sewage and industrial waste from lower Wayne County, where extensive growth is anticipated, will discharge into Trenton channel or through the Huron River.

Completion of the Rouge River interceptors should hold the line on this pollution source. While only one sewage treatment plant exists on the Canadian side of the St. Clair and Detroit Rivers, Canadian population is so relatively small that present pollution from Canada is less than from the U. S. even with treatment.

The quantitative aspect of future pollution cannot be forecast accurately but is ponderable. Comparing its 1913 and 1947 pollution surveys, the International Joint Commission concluded that in spite of sewage treatment provided in the years between, the bacterial load at the mouth of the Detroit River is three times greater.

Hazen & Sawyer note that (a) IJC's conclusions were based upon averaging samples from all across the river at the mouth, (b) river coliforms have dropped since completion of the Detroit sewage treatment plant, and (c) most of the new population and industry will be sewered to the Trenton channel, below the Grassy Island intake.

Gradient reversals in the Detroit River posed another puzzler for the consultants. Since 1911, the gradient in the Detroit River has reversed 11 times, most recently in 1948, due to strong winds from the east building up the water level in Lake Erie.

Water quality records available during these phenomena are of little aid in evaluating the effect, but existing Detroit River water plants apparently have not suffered. Hazen & Sawyer concede some adverse effect of water quality during gradient reversals, but venture that the effects may not be significant at the sheltered Wayne County intake. They point to a shoal area west of the intake and to Fighting Island itself to the east as protection from Canadian pollution. From Point Hennepin south, the polluted water in Trenton Channel cannot reach midstream because of Grosse Ile.

• **Project planning**—The two most likely intake sites were at Ft. Wayne (Range A) and off Grassy Island (Range D). The Ft. Wayne intake would cost $6 million more but offered the psychological advantage of being located above the Detroit sewage treatment plant and the Rouge River. However Hazen & Sawyer, emphasizing that actual difference in quality is negligible, could not see the extra $6 million merely for aesthetic value. More important, the Ft. Wayne intake would have to be a submerged crib because of navigation requirements, precluding use of surface water, while the downstream site permitted a tower intake.

Lake Erie water proved to be of no better quality than midstream Detroit River and an intake site there was eliminated from consideration on the basis of cost and susceptibility to the troubles because of shallow water (24 ft.).

The Grassy Island intake is proposed as a tower located between Grassy and Fighting Islands in Canadian waters, 5,000 ft from the American shore. Two rows of ports would permit the entire flow, a maximum of 450 mgd, to be drawn from either the surface or near the river bottom. Depth of water at the lower ports at low river stage would be 30 ft, sufficient to prevent most ice difficulties. Raw water would flow by gravity through a 12-ft-dia tunnel, probably in rock, to the filter plant site.

Low and high lift pumps and the treatment facilities would have an initial capacity of 150 mgd—sufficient for maximum daily demands in 1970. The treatment plant would provide for (1) 50 ppm dosage of activated carbon, (2) 20 ppm pre-chlorination, (3) 40-min flocculation, (4) 4-hr sedimentation, (5) filtration at 2.56 gpm per sq ft, and (6) 2 ppm post-chlorination.

• **Present status**—Hazen & Sawyer have now been retained by the Wayne County Board of County Road Commissioners for functional design of the project. Giffels & Vallet, Detroit, will turn out working plans and specifications for the pumping stations and filter plant while Parsons, Brinkerhoff, Hall & McDonald, New York, have been engaged for the tunnels and intake. Bids on the first work are scheduled to be called in March 1957. The intake site recently was approved by State of Michigan health authorities.

Richard Hazen and Alfred W. Sawyer, principals of Hazen & Sawyer, and F. P. Coughlan of that firm, conceived and directed the engineering study. R. A. Papp coordinated the assembling of cost data for the consultants. A. T. Kunze is Engineer of the Wayne County Water and Sewer Departments. Harold Leonhard supervised sampling for the county.

"Dairyland" contractor's big grader speeds U.S. 41 project

Safer winter driving for 24,000 vehicles daily

Boiling up a full blade-load of "buckshot" clay, Stack Construction Co.'s "660" grader cuts final sub-grade between north- and south-bound lanes on U.S. 41 south of Milwaukee, Wisconsin.

When there are two motor graders on a job and one is an Adams 660, invariably the tougher jobs are assigned to the big, powerful "660". Here's how a Milwaukee contractor divided the work on a recent Wisconsin highway improvement project:

Removed winter-driving hazard

Slippery pavement was a hazard to about 24,000 vehicles daily traveling on U.S. 41, just south of Milwaukee. Along 9½ miles of this busy 4-lane divided highway, the 45' median strip was higher than the road. Snow could not be pushed far off the roadway. Melting snow drained across the highway, kept the pavement wet and slippery, often froze into glare-ice when the temperature dropped.

Wisconsin State Highway Commission awarded Stack Construction Co., Milwaukee, a contract to remove the high middle-ground, and provide proper drainage. For dirtmoving, contractor used 3 C Tournapulls and 2 "D's", push-loaded by a rubber-tired Tournatractor. An Adams 660 and another grader did the blading.

Without interruption to busy highway traffic, Stack moved excess earth and cut a V-slope to provide drainage between traffic lanes. Contractor graded the island strip from road-shoulder height to 18" below grade at the center, and installed 12" feeders to carry surface water under the roadway to a drainage ditch.

"660" handles heavier work

Stack Construction Co. assigned the big 8-speed Adams 660 grader to their big-volume dirtmoving "team". The 150 hp "660" used its extra-power to scarify hard-packed cross-overs. Working in the tough, dry, "buckshot" clay, the Adams assisted scrapers . . . plowed up windrows of dirt for partial self-loading of Tournapulls. And blading at speeds, sometimes as high as 4.7 mph in 3rd gear, "660" cut the final sub-grades before the installation of drainage pipes.

Contractor assigned the lighter finishing tasks—spreading and grading top-soil, backfilling, and surfacing shoulders — to its slower, 6-speed, medium-weight, 115 hp grader.

Finished ahead of schedule

Leonard Stahoski, Secretary and General Superintendent of Stack Construction Co., feels that the Adams motor grader helped put their Highway 41 job ahead of schedule. "The Adams is very powerful and maneuverable for its size," says Mr. Stahoski. He adds, "This '660' has done everything asked of it, keeping our jobs on schedule."

The main reason why

Whether it's a "660" or any other Adams heavy-duty grader, the Adams is usually given tougher work. That's because only Adams has 15 speeds . . . 8 forward, 4 reverse, 3 optional creeper speeds. Compared to competitively priced graders, all heavy-duty Adams machines have more power-speed combinations . . . deliver more horsepower through anti-friction drive-train . . . provide more usable push-power on the blade.

On models 660 to 330, the Adams transmission gives you higher reverse speeds (12.2 to 13.7 mph) and faster road speeds (23.3 to 26.0 mph), which cut non-productive travel and shuttle time to the barest minimum. As a result, Adams helps you get more work done, speeds blading, increases productivity of other machines . . . pays you a bigger return on your investment in grading machinery.

See Adams graders in action

Call or write us, and ask to see an Adams motor grader at work. See for yourself why Stack Construction Co. and other leading contractors select Adams for their really tough jobs. Choose from 6 grader models:

New POWER-Flow 660	190 hp		
with torque converter		30,200 lbs.	
Model 660	150 hp	30,050 lbs.	
Model 550	123 hp	26,370 lbs.	
Model 440	104 hp	24,080 lbs.	
Model 330	80 hp	23,020 lbs.	
Model 220	60 hp	15,500 lbs.	

Adams—Trademark, Tournapull, Tournatractor —Trademark Reg. U. S. Pat. Off. AG-30 H 5-6

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Beam Test

W. E. Dean
Asst. State Highway Engineer
Florida State Road Department
Tallahassee, Fla.

A test made to determine the capacity of a prestressed concrete bridge beam also yielded other valuable conclusions:

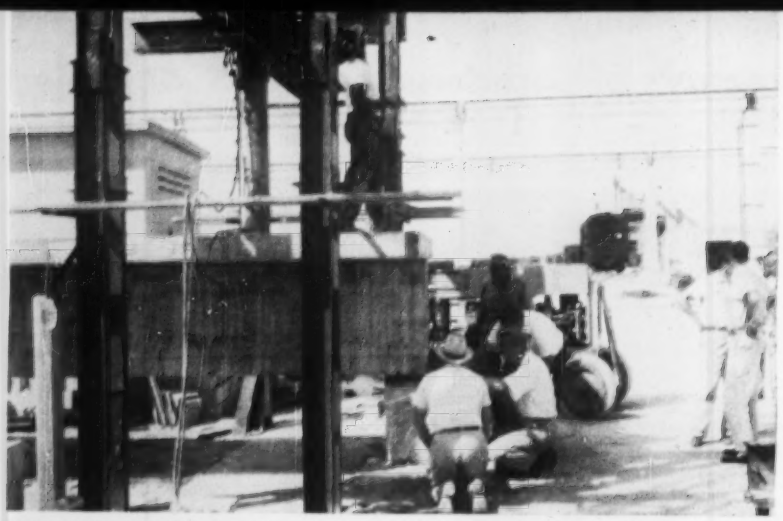
- Some web reinforcement is advisable in concrete beams even in sections where computations indicate it is not needed.
- Bond is ample between a precast beam and a cast-in-place top slab, without shear keys, to resist horizontal shear.

The full-size test beam was typical of the members being furnished for a large urban bridge project in Miami, currently under construction by the State Road Department of Florida. Included are a series of trestle spans 45 ft in length with precast, pretensioned concrete beams spaced 6 ft c-c laterally. The 7-in.-thick deck acts integrally with the beams as a composite T-section for live loads.

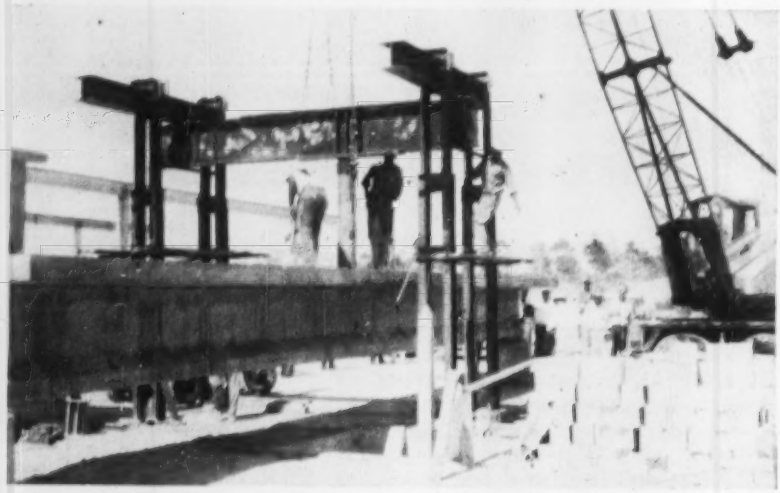
Shear development between beam and slab, and web reinforcement for the beams, is provided by inverted U-type steel stirrups. The loop of the U projects above the top of the beam, and the two legs extend through nearly the full beam depth.

Through error, the producer provided short stirrups extending only through the top flange. Thirty-one beams were manufactured with these stirrups and thus without web reinforcement before the error was discovered. A sketch shows details of the beam with web reinforcement as specified and as furnished.

- **Test objective**—Design calculations indicated that principal tensile stress probably was not critical even at three

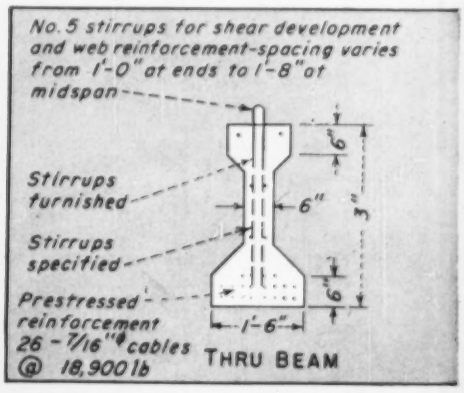


END SHEAR TESTS of prestressed concrete bridge beam caused no distress even with four times the design load and less web reinforcement than specified.



BENDING TEST with a central load was made on the beam. Cracking occurred at three times design load; at higher loads the load-deflection curve flattened out.

FAILURE occurred in the bending test under 4.6 times the design load—but by collapse of the web. The top slab did not pull away from the beam.


No. 5 stirrups for shear development and web reinforcement-spacing varies from 1'-0" at ends to 1'-8" at midspan
Stirrups furnished
Stirrups specified
Prestressed reinforcement
26 - 7/16"ϕ cables @ 18,900 lb
6"
1'-6"
THRU BEAM

SECTIONS show how the beam, as fabricated, and the test specimen made from it

Shows Need for Web Steel

times the H20–S16 live load. To justify the use of these beams the producer was required to test, at his expense, one beam under simulated bridge loadings. The criterion established for acceptance was that the test specimen must withstand without failure an applied load equal to three times design live load plus impact.

To simulate the actual bridge section, a reinforced concrete slab 7 in. thick and 6 ft wide was cast on the beam to form a composite T-section (see sketch). The test was carried out at the plant of R. H. Wright & Son in Fort Lauderdale on Oct. 17.

• **Beam withstands end shear**—First, the shear load was applied in multiples of the full end reaction for live load and impact. At three times the design load—the criterion for acceptance—no physical change in the 45-ft specimen other than a slight deflection could be noted.

Before the shear test was abandoned the load was raised to four times the design load. At this extreme overload, there was absolutely no sign of cracking or distress in the web of the beam or at the junction between slab and web, nor was there any indication of bond slippage of the 7/16-in. cables used for prestressing.

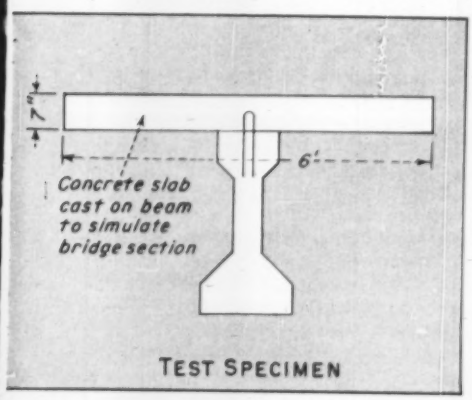
• **Beam also takes bending**—The loading equipment then was shifted to the span center for application of the bending load. A load equal to three times the design load produced only minor cracking through the bottom flanges. On removal of the load the cracks disappeared and there was almost complete recovery of the deflection.

The first apparent permanent damage came at the application of about 3.8 design loads. With removal of this load, however, bottom-flange cracks closed almost completely, but open cracks were left in the web. A permanent deflection of about ⅛ in. remained.

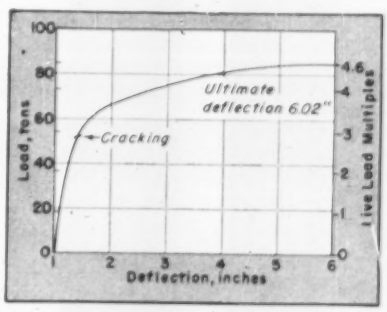
• **But web fails in shear**—The specimen withstood the application of 4.6 design loads before failure. Immediately prior to failure, the load-deflection curve through yielding of the reinforcement, had become practically a straight line. Actual failure occurred when a large section of the heavily cracked, unreinforced web disintegrated and fell out. Since the specimen met the established criterion, the remaining 30 beams were accepted.

The Florida Road Department has tested several full-size prestressed bridge members in recent years. The type of failure in this test was different from that of any other specimen tested. The full potential ultimate load in bending was reached, as evidenced by the yielding of the reinforcement and consequent flattening of the load-deflection curve; yet actual failure was by collapse of the web. Thus, while the full ultimate load was reached, the beam collapsed prior to the full potential deflection that probably would have been reached if the web had been reinforced. This would seem to substantiate the recommendation given in the Criteria for Prestressed Concrete Bridges, published by the Bureau of Public Roads, for the use of minimum web reinforcement whether or not computations show it is needed.

• **Beam–slab bond**—Except for a few small depressions in the top flange near the beam ends, shear keys were not used to develop the junction of beam and slab. The stirrup loops extending above the beam tied the two elements vertically, and bond between slab and beam resisted the tendency to horizontal movement.

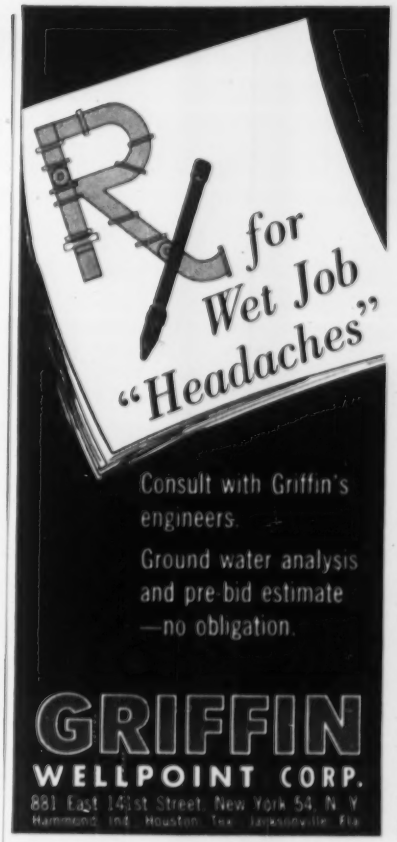


TEST SPECIMEN



LOAD-DEFLECTION CURVE for the bending test indicates that cracking took place when the load reached a value of three times the design load. Under conditions of higher loads the curve flattens out.

were left without web steel because of short stirrups used by mistake.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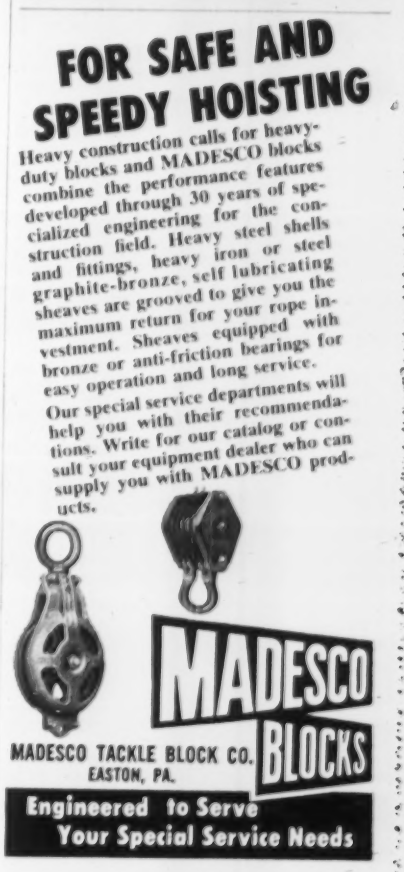
Hammond, Ind. Houston, Tex. Jacksonville, Fla.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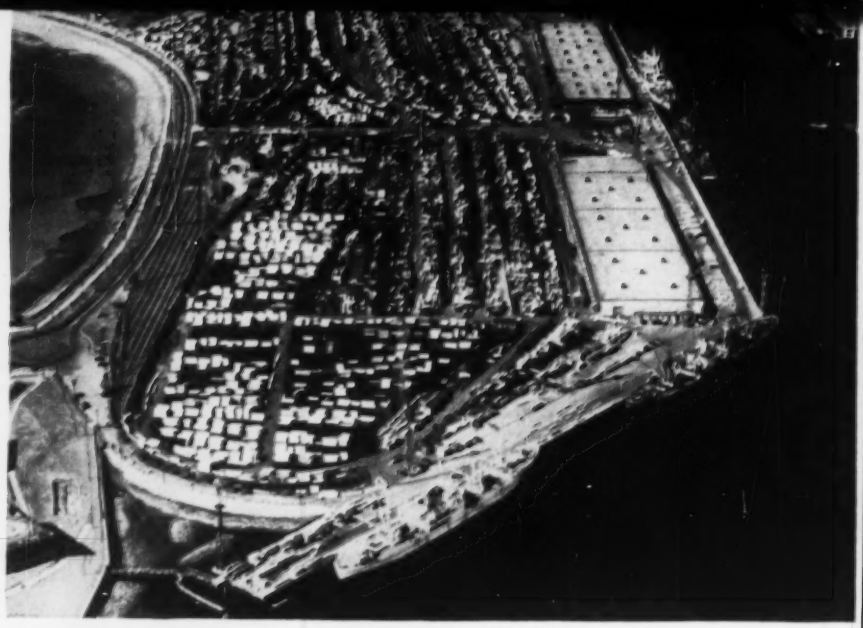
BOSTON'S PROBLEM: Rebuild the important Castle Island marine terminal (right) without interfering with operations. The answer was a design for . . .



Construction Without Disruption

1. Ships unload cargo into trucks and freight cars during foundation work. Low cut piles and clean deck permitted access to shed throughout most operations.

2. Erection of roof trusses between old shed and waterfront complicated, but did not prevent, using entire facility. Apron was clear for cargo at all times.

Latest move in Boston's push to improve its position as a top seaport is an unusual $2 million expansion of the city's Castle Island Terminal—a job being done with almost no interruption to cargo handling.

Without the improvements now under way, the terminal provided over 4,000,000 sq ft of track-lined open storage, 310,000 sq ft of covered storage. Its ¾ mile of deep water, quay-type berthing space offers simultaneous service for eight ocean-going general cargo ships.

The work now in process will increase the covered storage space to 400,000 sq ft, will provide 10,000 sq ft for offices, and 36,000 sq ft of temperature controlled storage area. The key to maintenance of terminal operations during expansion lies in the design of the new structure—and particularly in its foundation—which permits the contractors to limit their working area without losing time.

As North America's first, and for years, most important shipping center, the development of Boston, and in fact, of New England was to a large extent dependent on the city's port facilities. Like other ports, however, it got behind the technological advances in transportation methods. Piers built for small sailing vessels remained to serve, as best they could, large steamers. Dock-side areas geared to the horse and wagon were forced to accommodate huge tractor-trailers.

It took World War II to highlight on a national scale the great need for better wharfage. Some ports acted im-

mediately—some are just now beginning to move (ENR Oct. 18, p. 21).

As soon as materials were available, Boston jumped into a long range program of port terminal rehabilitation and expansion which may total $90 million worth of work before it is completed. In 1951 the Port of Boston Commission completed the Hoosac Terminal, 500 ft x 507 ft pier containing 200,000 sq ft of covered transit space and adjacent one million bushel grain elevator complete with a 30,000 bushel per hr conveyor. In 1952, opening of the $5.5 million Mystic Terminal brought to 13 the number of state owned piers.

The older installations, meanwhile, have not been neglected. The 1,200 ft, five-berth Commonwealth Pier No. 5 is now undergoing major alterations, and the $75 million Boston Army Base, soon to be taken over by the Port Commission, is getting an $11 million face-lifting. (ENR Nov. 1, p. 36).

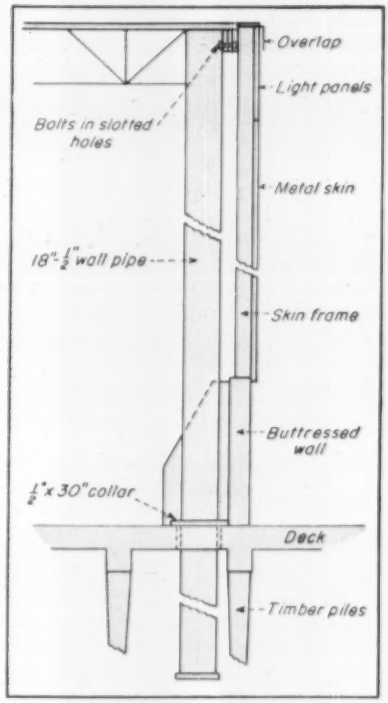
• Building on a building—At Castle Island, a 14-year old 840 ft x 180 ft brick structure with wood roof trusses and closely spaced columns is being incorporated into a 240 ft x 960 ft steel structure. Piles used as columns and a wall designed to settle with the floor independent of the roof and its columns, are outstanding features of the work.

The original structure had an apron 100 ft wide, was without heat, and handled large trucks with difficulty. Since the over-sized apron increased cargo handling time and unnecessarily exposed longshoremen to the elements, George Wey, chief engineer of the port commission, decided to kill two birds with one stone: enlarge the covered area and reduce the apron by building the new extension on the apron.

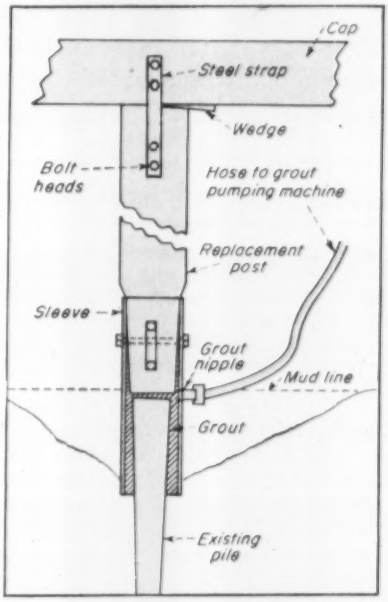
The problem was further complicated: the pier deck on which the new building was to stand comprised two separate units—an inside flat slab of reinforced concrete connected by means of a timber movement joint to an outside concrete covered wood deck. The entire pier is carried on timber friction piles, which are expected to settle to some extent under the heavier loads to be superimposed. Most of the piles are creosoted and in excellent condition. A few, however, are untreated and are so decayed above the mud line that repairs must be made in the tight and almost inaccessible under-deck area.

• Piles on piles—To construct a foundation for the new building without tearing up the old deck, and to erect the new building over the old pier without putting its weight on the existing foundation, Wey proposed an unusual construction procedure:

Twenty four inch holes were cut through the deck on the exact location of new columns. Through the holes were driven 18-in. pipe (with ½ in. thick walls) to the bottom of which had been welded flat plates. Driven to practical refusal, the piles run up to 110 ft long (tip to top of deck). Immediately after being driven, each pile was cut off within two ft. of deck level and filled with concrete. This kept the deck clear and by cutting holes only just ahead of the pile driver, out-of-service section of the pier was limited to the immediate driving area. All other parts of the facility, both ahead and behind the driver, were available for cargo handling.



3. Concrete wall base rests on deck. Slotted holes permit settlement adjustment



4. Grouting makes splice solid, fills all voids, compensates for uneven cutting.

On completion of the driving operation, (70 piles totaling 8,000 lineal ft) upper pile sections of the proper length were welded to the driven section to become roof truss supports. The small gaps between the side of the pile and the deck were covered by a ¼ in. thick, two-piece collar having an outside diameter of 30 in. The pieces were fitted snugly around the pipe at deck level and welded in place.

With the new structure ready for roof trusses, half the north wall of the existing structure was removed. Outside ends of exposed roof trusses were supported by screw jacks and ,as each new steel truss was set, the corresponding wood truss was placed on the new support.

• Wall on vertical slide—Because the friction piles supporting the deck ultimately may settle as much as 1½ in. under the heavier loads now to be carried, while the piles carrying the roof will not settle at all since driven to rock, an independent wall design was needed.

The answer to the problem was to design a wall that would permit a vertical slide of its members. A six ft high buttressed wall of reinforced concrete was poured on the deck just outside the new column line. On this rests a lightweight wall of protected metal siding affixed by stud welding to a light stiffening frame. The top of the wall frame is attached to the roof framing and the columns by bolts running through vertically slotted holes 5 in. in length. As the deck, and consequently the buttressed wall, settle, the upper skin wall will slide down too. An external vertical overlap attached to the roof assures a weatherproof roof-wall joint regardless of wall settlement.

• Grout-joint pile splice—Satisfactory sub-aqueous splicing of timber piles is usually difficult and time consuming. At Castle Island, 75 such splices must be made to renew decayed untreated timber piles. The close quarters in which work must be done, coupled with the length of the replacement posting (48 ft) indicates trouble. To lessen the difficulties the following plan has been conceived:

Bad piles will be cut off at the mud line by a diver using an air saw. On the deck, replacement tops of the proper length will be fitted with a specially designed pipe sleeve. The sleeve will be 36 in. long and will have a grout nipple welded to a hole cut at the midpoint. The pile top will be fitted into

an ACCO product

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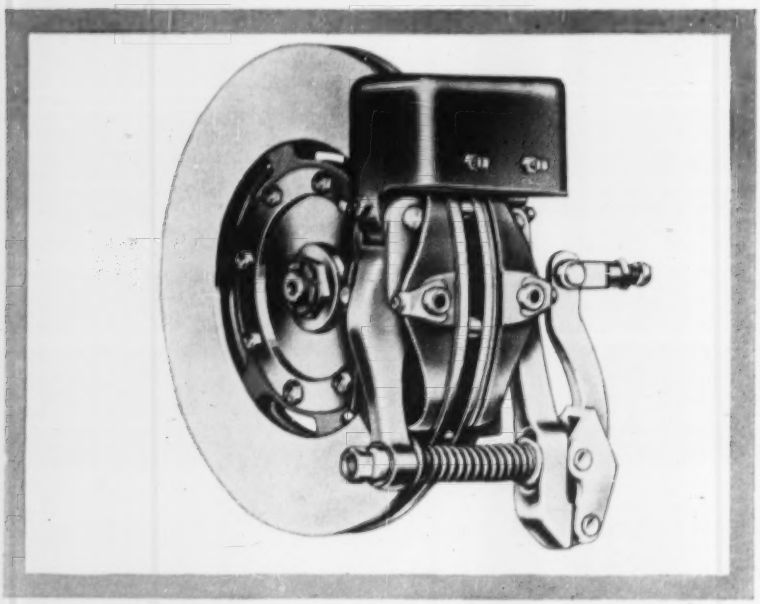

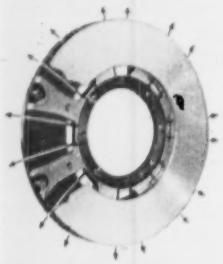

This is The Difference

One look at a TRU-STOP Brake is enough to know that it will cool itself faster than any other known type of brake.

1. Most of the disc is exposed to the air even during the braking operation.

2. The ventilated design supplies cooling air which circulates between the disc plates.

1. EMERGENCY • TRU-STOP BRAKES operate on the propeller shaft. They serve as a complete and independent braking system. They enable the driver to continue on *SAFELY*, in event of service brake failure.

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3. AUXILIARY • Most drivers occasionally use the hand brake to help the service brake. TRU-STOP Brakes have the surplus braking capacity to be used in this way—repeatedly.

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the sleeve so that the grout nipple is at its bottom end.

After the sleeve is bolted to the timber, the unit will be rolled into the water and floated to the desired location under the deck. The sleeve end will be weighted and sunk. The diver will fit the sleeve over the cut-off pile and, with help from above, will slide the post top under the pile cap to be supported. Wedges driven between the post and the cap will tighten the connections, and metal straps bolted to both the post and the cap will fix the top joint.

Any voids between the top section and the old pile, or between the old pile and the sleeve, will be filled with grout pumped into the splice area through the group nipple.

For Your Holiday TV Viewing

Dramatization of an exciting construction project, completed on an emergency basis back in 1950, will be shown on television Sunday, Dec. 30. The story is a true one, dealing with a slide that blocked the irrigation tunnel carrying water from the Upper Colorado River to Colorado's Grand Valley (ENR, 1950—Mar. 30, p. 22; Apr. 20, p. 29; May 4, p. 26).

Telephone Time, the television program putting on the show, will deal with the decision, drama and work involved in holing through a new tunnel and getting water to the valley in time to save crops. This is the second construction story Telephone Time has chosen to dramatize in its current series of true adventure tales.

Make Rain? It's a Bet!

Williams, Ariz., shipping in domestic water at 120,000 gpd in Santa Fe tank cars, has made a $2,000 bet with two Chandler, Ariz., men.

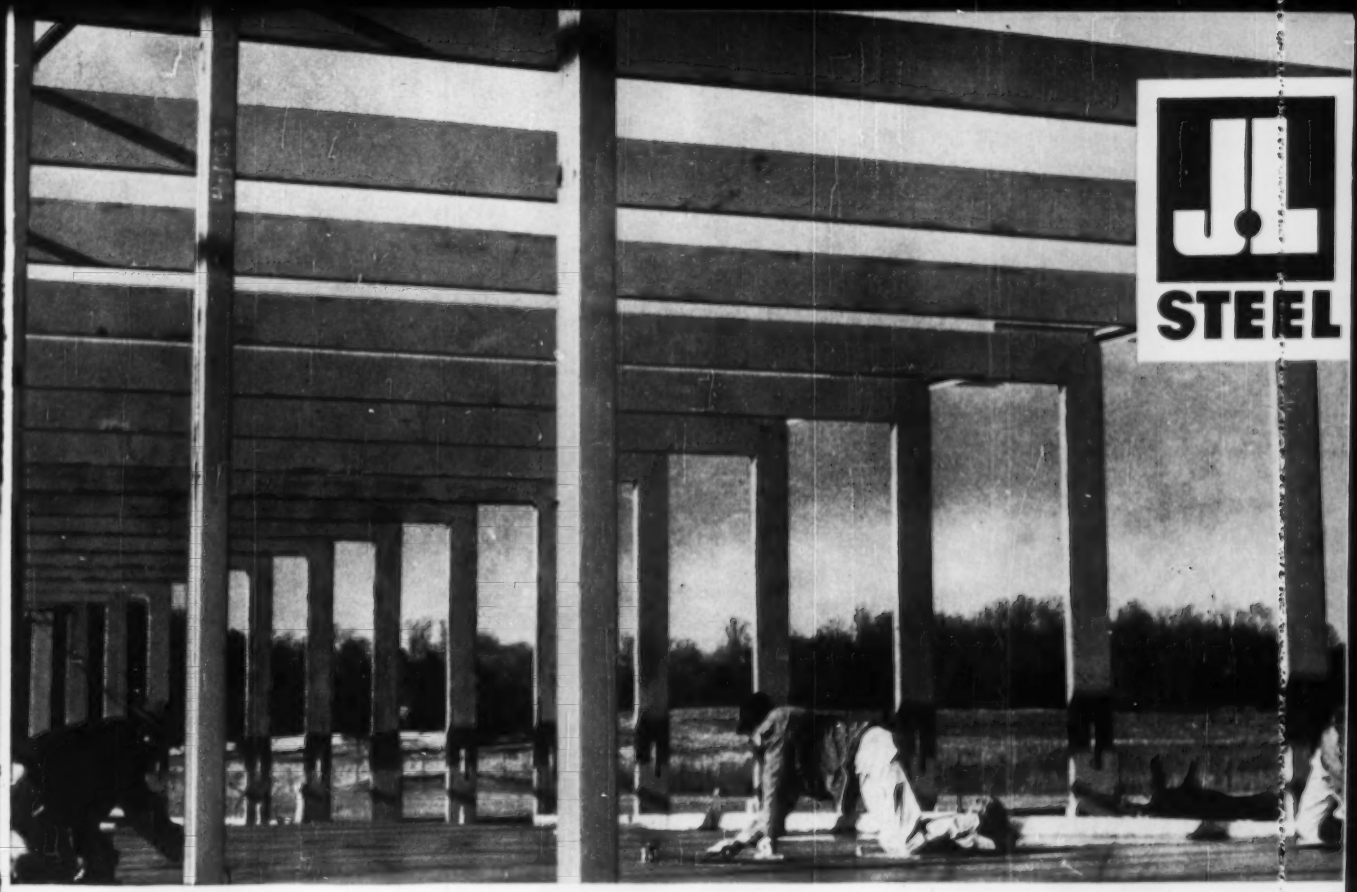
Homer F. Berry and Charles L. Hatfield have signed a contract to produce rain—lots of it.

They'll get the money if "through their efforts" the community's seven reservoirs are overflowing by March. But if the two rainmakers, using silver iodide seeding methods, don't produce reservoir-filling rains—no pay.

"We have nothing to lose," says Mayor Les Parker.

Maryland Expressway Opened

The last 14-mile section of Maryland's Eastern Shore Expressway was dedicated by the State Roads Commission and opened to the public earlier this month. This road, which is a part of the Maryland Blue Star Memorial Highway, now is in use for its entire 48-mile length from Chesapeake Bay Bridge to the Delaware line at Warwick.



J&L STEEL

RIGID STEEL BENTS FORM BASIC FRAME OF WHEATLEY SCHOOL, EAST WILLISTON, LONG ISLAND

Boxed and Exposed J&L JUNIOR CHANNELS give classrooms clean, fresh appearance

Architect W. Frank Bower, Jr., of La Pierre, Litchfield & Partners, New York, has employed 130 tons of Junior Channels in the new two million dollar Wheatley School (East Williston, Long Island Junior-Senior High School). The 12″, 10.6# Junior Channels are boxed to make rigid bents forming the basic frame of the classroom buildings.

The bents were fabricated in two sections by De Voe Iron Works, Inc. of Long Island City, then trucked to the job. Erection went fast. Mr. Stephen J. De Voe, Jr. reported that it required only five hours to erect the 56 bents in one 232′ x 71′-4″ building.

Mr. Bower summed up the advantages of using J&L Junior Channels in the school's unique design by saying:

"The exposed structural steel bents or rigid frames are the basic frame of the building. This was done to take advantage of insulating cement and wood fiber structural plank which has excellent acoustical properties. In addition we avoid the use of hung ceilings. As a result we estimate savings of $40,000 to $50,000 on this $2,000,000 building.

"This type of construction eliminates the confined air space between roof and hung ceiling which, unless mechanically ventilated, stores hot air to reflect heat on the classrooms in the warmer months. The rigid frames give a cleaner, fresher look than alternate materials. We prefer them as being more interesting than the usual flat hung ceiling. They also give us a chance to introduce more color into the classrooms."

If you're designing light occupancy buildings, ask us for complete information about J&L Junior Channels. Take advantage of the strength of these light weight hot rolled sections, and their adaptability to a wide range of architectural design.

Jones & Laughlin
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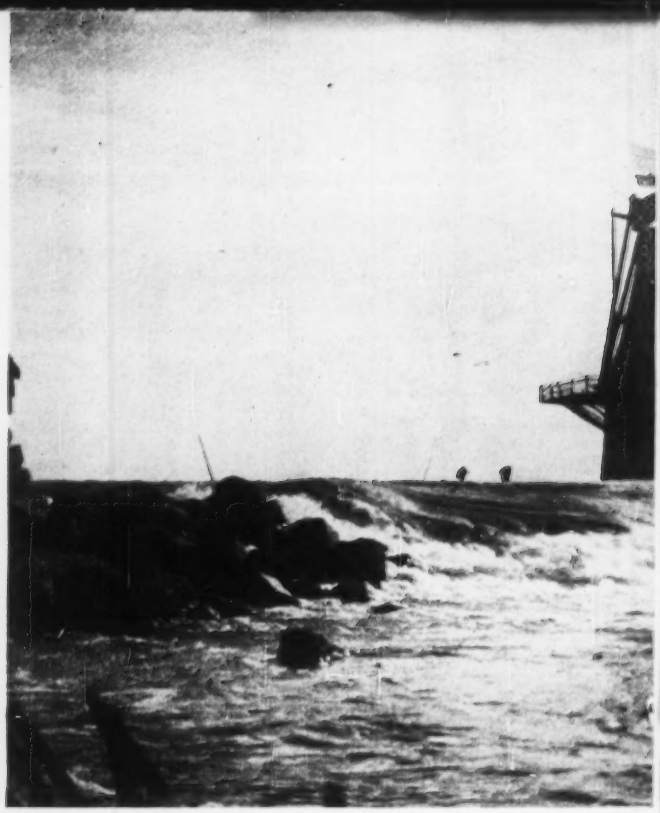
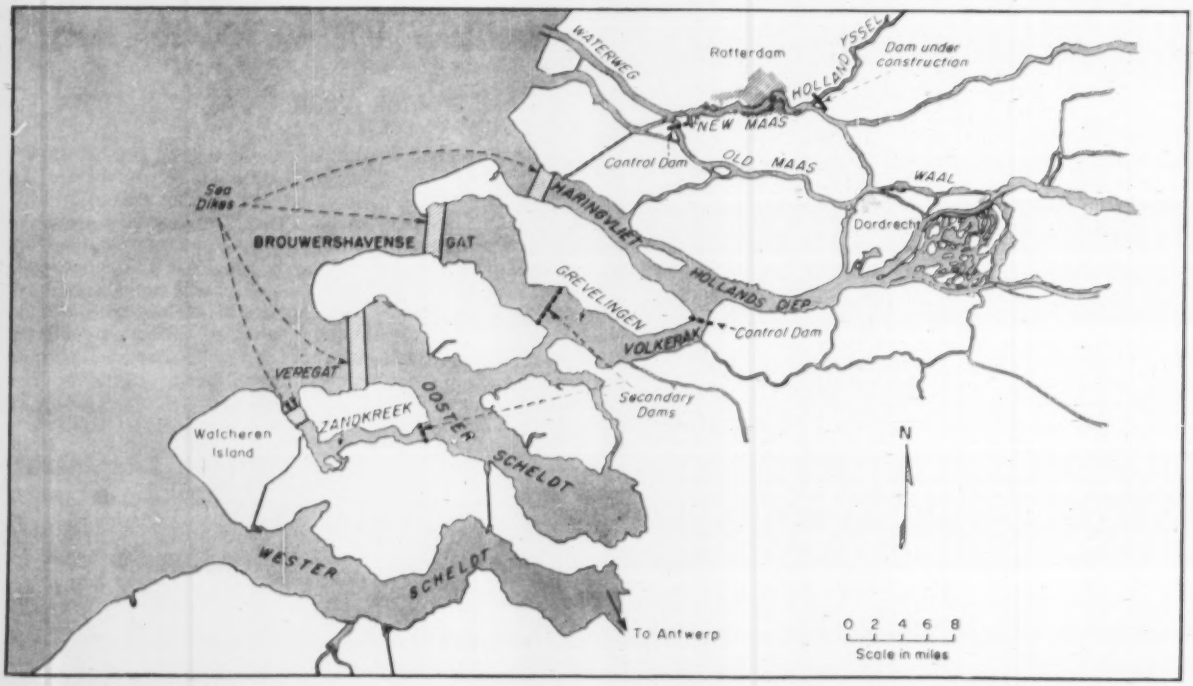
Artist's rendering of the Wheatley School



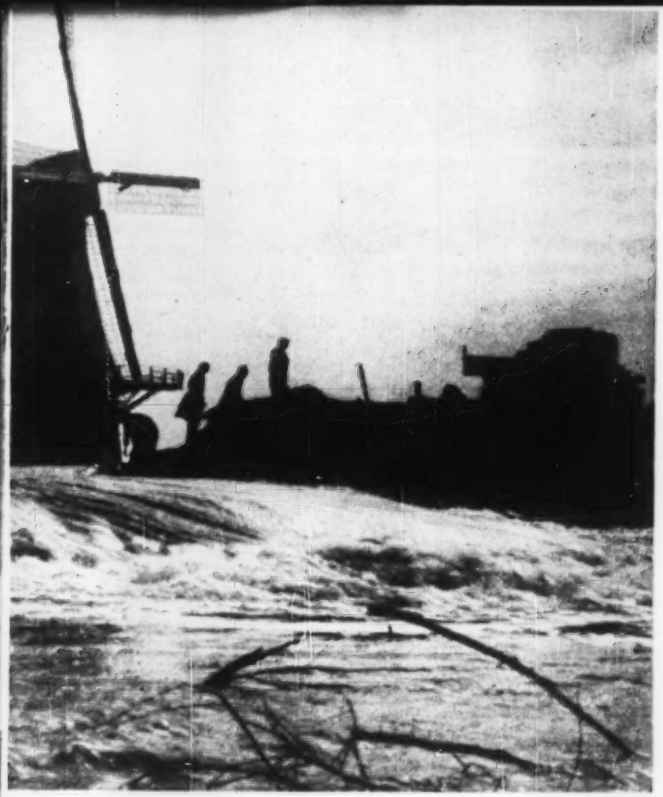
Breach in Dutch dike caused by the great storm of Feb. 1, 1953

TO PREVENT THIS . . .

Holland Begins Huge Project for Defense



THE DELTA PLAN will ward off inundations from the North Sea by blocking four estuaries (Veeregat, Ooster Schelde, Brouwershavense Gat and Haringvliet) with tremendous dikes. Auxiliary works will maintain these estuaries as fresh water lakes and, in addition, free Rotterdam's North Sea connection, the Waterweg, from both floods and low water.



HOLLAND HAS CHARTED three extensive plans to protect itself from the sea and provide it with more land. The Zuidersee scheme begun in 1930 is half complete. The Delta scheme is just starting, and will not be finished before 1980. The Waddensee scheme is planned but still a dream.

Against Sea

Late last summer the first of many willow fascine mattresses was lowered 75 ft to the bottom of the Haringvliet as the beginning of a dike to close off this estuary of the North Sea, which penetrates Holland south of Rotterdam. It was an historic action born of a night of disaster on Feb. 1, 1953, when wind and tide in unprecedented concert caused inundation of 600 sq miles of southeastern Holland and the loss of 1,800 lives.

This Haringvliet dike will be only the first of four to close off the estuaries in this region of southeast Holland against North Sea storms, and at the same time create freshwater lakes as a deterrent to the progressive salt water incursion now threatening Dutch agriculture. Known as the Delta Plan, this huge project, which also includes other dikes supplementary to the main ones, eventually will surpass—in magnitude and engineering and construction difficulty—Holland's other world famous sea defense undertaking, the closure of the Zuidersee.

It was, in fact, the experience gained in building the great 20-mile-long dike that closes off the Zuidersee from the North Sea, and the success in converting this saltwater estuary to a freshwater lake that gave Dutch authorities the courage to tackle their southeastern estuaries in the same way—even though the 1953 storm probably would have driven them to the gamble anyway. But, whereas the Zuidersee project was basically a land reclamation scheme, the Delta Plan primarily is concerned with defense against the sea.

The new southeastern dikes will, of course, prevent existing farmland from being poisoned from saltwater, but they will permit the addition of less than 50,000 acres of new land. In contrast, by dredge-filling over half of the Zuidersee area, some 500,000 acres of new land eventually will be created. Already, 170,000 acres of this new land are under cultivation—50,000 in a polder created in 1930 as a part of the closure dike itself and 120,000 in a polder constructed and drained between 1937 and 1942 in the eastern part of the lake. Only last September the Dutch held a big celebration to mark the completion of a dike enclosing another 133,000 acres of the Zuidersee to be filled and drained next year. Two other areas, immediately east of Amsterdam, are to be reclaimed to complete the $600-million job by 1975.

The Delta Plan, also with a $600-million price tag, has a time schedule that runs from 1956 to 1980. And sometime before these two projects run their course, it is planned to inaugurate a third, the so-called Wadden reclamation. The latter will involve joining the string of islands (West Frisian Islands) off Holland's northwestern coast with dikes to isolate the body of water behind them (Waddensee) from the North Sea, and then to fill it with dredged material to add several hundred thousand more acres to the country's arable land.

Starting the Haringvliet dike actually jumps the gun on the Delta Plan since the bill for financing the scheme is still in the Dutch parliament. No one doubts, however, that it will be passed and, in the meantime, the threat to the port of Rotterdam and the areas to the east of it is so great that no further delay could be countenanced on the Haringvliet dike.

The broad detail of the Delta Plan is shown on the accompanying map. The four dikes, totaling about 15 miles in length, cross, in order from north to south, (1) Haringvliet; (2) the Brouwershavense Gat; (3) the Ooster Schelde; and (4) the Veeregat. Supplementary dikes also will have to be built across Zandkreek and Grevelingen to facilitate construction of the main dikes, and across Volkerak and the Old Mass River to control water levels. Minor undertakings also will be required to assist drainage, navigation and fish culture.

It will be noted that no main dikes are contemplated across the Wester Schelde, which comprises the entrance to the port of Antwerp in Belgium, nor across the Rotterdam Waterweg. While this leaves two points open in

. . . Holland begins huge defense project

the sea defenses, it was believed to be a necessary gamble as otherwise shipping would have to negotiate locks, with consequent delay and inconvenience. Nevertheless, there are elements in the plan of vital importance to the port of Rotterdam, particularly with respect to floods on the one hand and low water for navigation on the other.

The Waterweg, which connects the port with the sea, is one of the principal outlets for the water brought down by the rivers that converge on Rotterdam—the Yssel, the Lek, the Waal and, to some extent, the Old Maas. A dam with sluices and locks is already under construction across the Yssel east of the city. Scheduled for completion in 1958, it will protect the interior lowlands from tidal storms, and hold back some of the floodwaters from Rotterdam. In times of low water it also will be able to release water into the Waterweg to assure sufficient depth for navigation.

• Built-in Safety Valves

But the services that Yssel Dam is schedule to perform will be greatly aided by two of the elements of the Delta Plan—a weir across the Old Maas River and the Haringvliet dike. When the water coming down the Lek and the Waal is too much for the Waterweg to handle, either in volume or velocity, the Old Maas weir can be opened to relieve the pressure. In turn, additional relief can be provided by opening sluices in the Haringvliet dike, which will be designed to pass 3½ mg per second. On the other hand, when the river levels are low, all the sluice gates will be closed so that all of the flow can pass to the sea through the Waterweg. This also will aid in pushing the saltwater farther seaward, to the benefit of the fresh water supplies of Rotterdam and central Holland.

• Water Supply, Icebreaking

It is one of the great advantages of the Delta Plan that it provides large storage reservoirs for fresh water. This is accomplished with the aid of another supplementary dam to be built across the Volkerak (see map). By opening the sluices in this dam whenever there is a surplus of water, and closing them as soon as the water level in the north drops below that of the south, water can be stored in the estuary lakes where it is available to be distributed to all of the surrounding territory. These lands are now so lacking in fresh water that an augmented supply could increase their productivity by 30%, it is claimed.

The Volkerak Dam also will be useful when it is desired to open the sluices in the Haringvliet dike to permit controlled entrance of warm tidal currents in winter as a means of breaking up ice in Holland's Dip and the water courses around Rotterdam. When this is done, the sluices in the Volkerak dam will be closed to prevent the estuary lakes to the south from silting up or taking in salt water. Locks in this dam will permit vessels to pass at all times.

There are two other supplementary dikes or dams in the scheme—across the Grevelingen and Zandkreek. The dam in the Grevelingen is necessary to permit construction of the main outer dikes across Brouwershavensche Gat and the Ooster Schelde under reduced current conditions. Without the supplementary dam, construction of the two main dams would have to progress simultaneously and with extremely close coordination. Where the Grevelingen dam is planned there are virtually no currents, so that its construction will be relatively easy.

The Zandkreek dam also is situated in an area of slack water. This dam and the southernmost main dike across the Veeregat will be the first to be built under the scheme, since they will join three islands into a single unit, making them more accessible to industry and extended agriculture. Workers on these islands also can get to the Rotterdam region in an hour instead of the more than two hours now required. What these two short dams actually do is to convert these three islands into a peninsula of the mainland, which will contain a fresh water lake in its center.

• A Wartime History

One of these three islands is Walcheren, made famous during the war when the Allies had to breach its protecting dike in three places to flood out occupying Germans who otherwise controlled the entrance to the vital supply port of Antwerp. The postwar repair of these breaches, particularly the last one at Fort Rammekens, furnished one of the great construction operations of history. A total of 34 old ships was sunk in the gap, including two of the great Phoenix caissons built for the wartime floating harbors in Normandy, and the equipment required included 36 tugs, 89 barges, 6 dredges, 3 cranes and 5 draglines. Yet a comparison with what the Dutch used to repair a breach on Schouen Island following the storm of February, 1953, makes these figures look inconsequential—126 tugs, 283 barges, 38 dredges, 49 cranes, 105 draglines.

It is great and expensive repair operations such as these that the Delta Plan is designed to make unnecessary. And it is the precedent established by these operations that furnishes the confidence that, with like magnitudes of plant and the same working around the clock for days on end, the big main dikes of the Delta Plan also can be constructed. The first one, at Veeregat, will be 1½ miles wide and 50 ft deep, greater than any yet attempted, but small compared with those required for 5-mile Brouwershavense Gat or the 6-mile Oster Schelde.

On all of these dikes, as already at Haringvliet, work will start with the sinking of willow mattresses weighted down with heavy stones to prevent the seabed sand from being scoured out. The tidal range is about 12 ft, and the mattresses will be placed at slack water in depths up to 85 ft. The second operation will be the building of a wide "threshold" or underwater dike of shale and basalt up to a height of 30 to 40 ft below mean sea level. On this threshold will be sunk a line of concrete caissons to form a mole projecting far enough above water to protect against even bigger storms than that of 1953. These caissons will be equipped with sluices whose gates will be left open until the mole is completed so as not to impede the flow of the tides. Then all of the gates will be closed simultaneously, and the interior of the caissons filled with ballast.

These are the kind of operations that Holland looks forward to over the next quarter century as its hydraulic engineers and construction contractors go to work on the Delta Plan to provide their country with impregnable sea defenses.

Complete Sewerage System Slated for Oahu Community

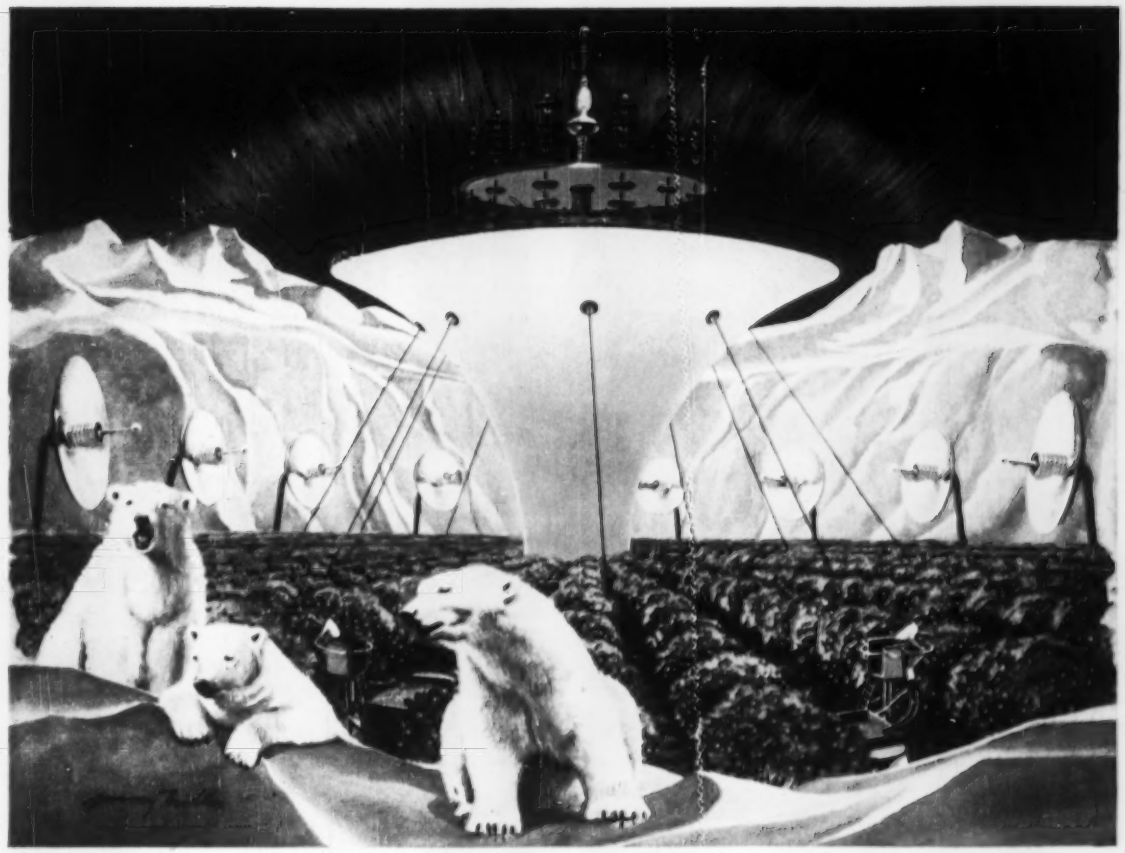
Engineering studies and preliminary plans for a complete sewerage system—including treatment plant, pumping station and ocean outfall—are under way for Kailua, Oahu.

The engineers report—by Holmes & Narver, Inc., Los Angeles—is due March 1, 1957. A final report is scheduled for May 1, 1957.

An excellent beach is the greatest recreational asset of Kailua, which is located on the west side of the island of Oahu. Therefore, avoidance of water pollution is of prime importance in design of the new sewerage system, according to Boyd Guymon, chief sanitary engineer of Holmes & Narver.

An increase in population for Kailua is expected when a vehicular tunnel through Nuuanu Pali Mountain opens next year, shortening the distance to Honolulu to five miles.

(Continued on page 49)



Huge solar engines imprisoning the heat of the sun may create islands of fertility in icy wastelands, thus vastly increasing the productive food areas of the earth.

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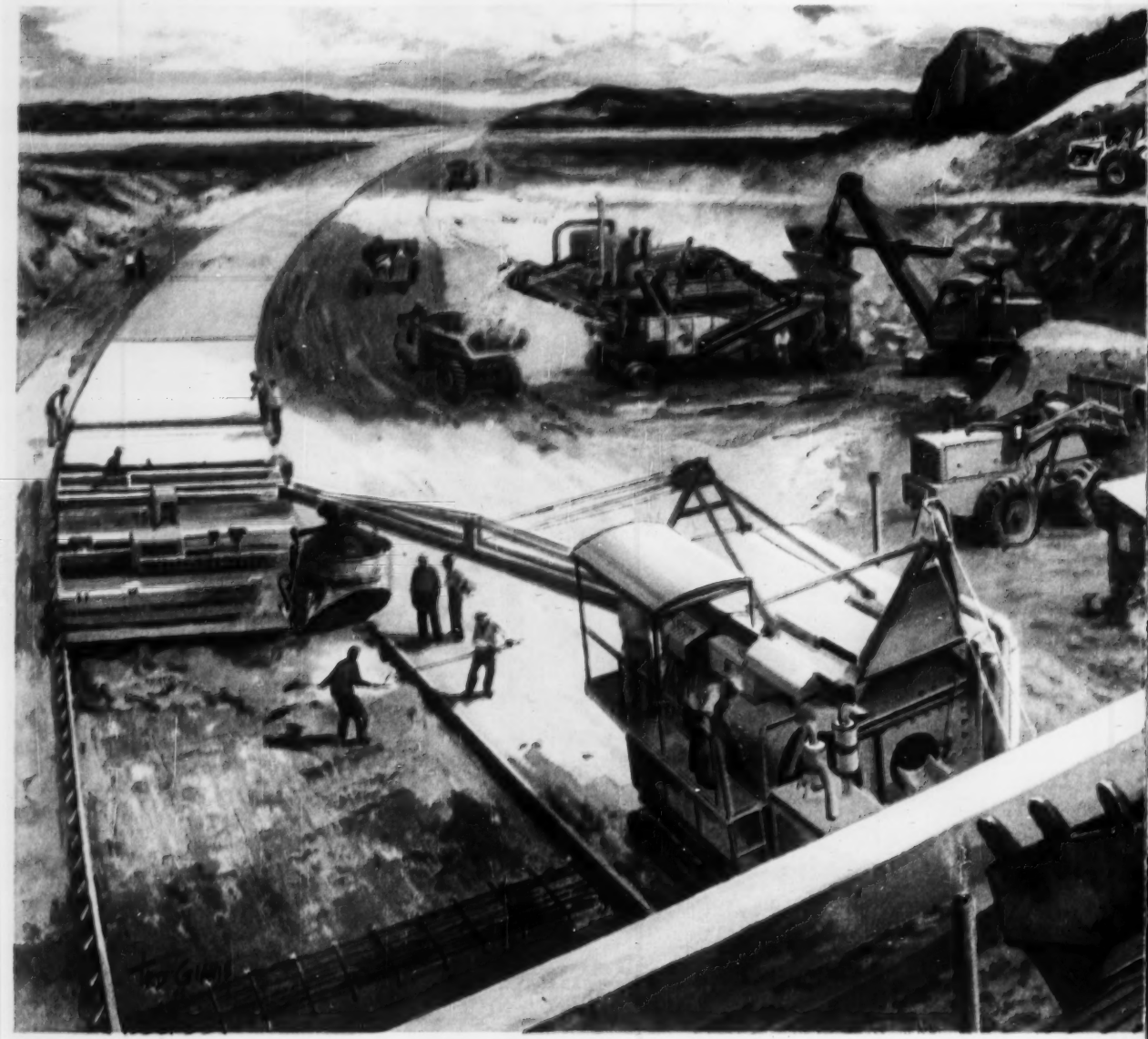

It's GM—Choice of more than 150 equipment builders

General Motors Detroit Diesel engines power more different types of road-building equipment—built by more manufacturers—than any other Diesel.

These versatile two-cycle engines drive compressors, crushers, drills, pavers, graders, shovels and the world's most powerful off-highway vehicles.

Leading manufacturers install GM Detroit Diesel power in more than 1000 different machinery applications because it gives their customers unequaled work output and dependability, plus the backing of a world-wide service organization.

Contractor experience has proved GM Detroit Diesel power more efficient than either gasoline engines or other Diesels on almost every kind of job from 30 H.P. up. And Detroit Diesel's new Turbopower engines deliver even higher efficiency —*up to 17% more power on the same fuel, or the same work with fuel savings up to 15%!*

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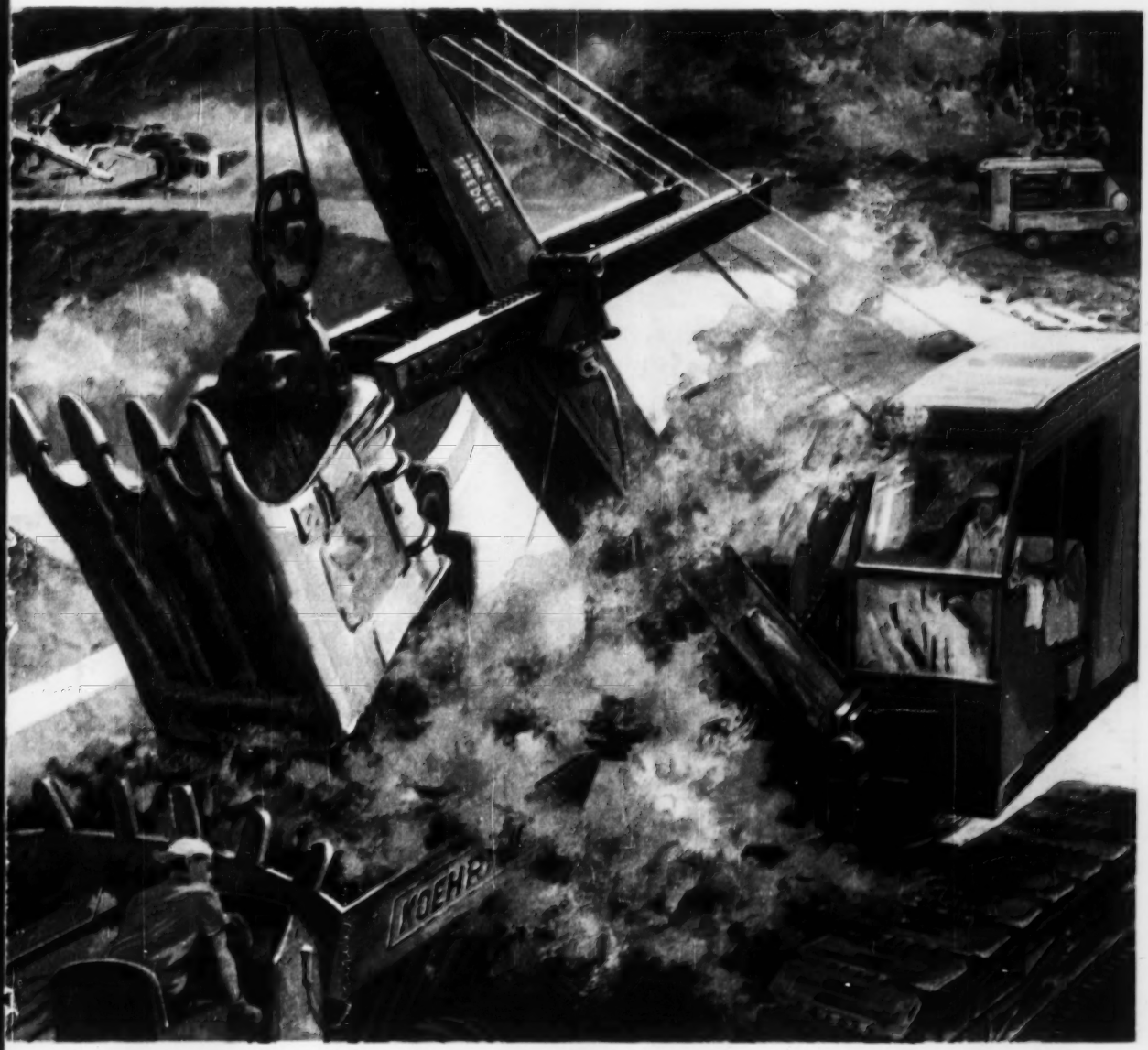
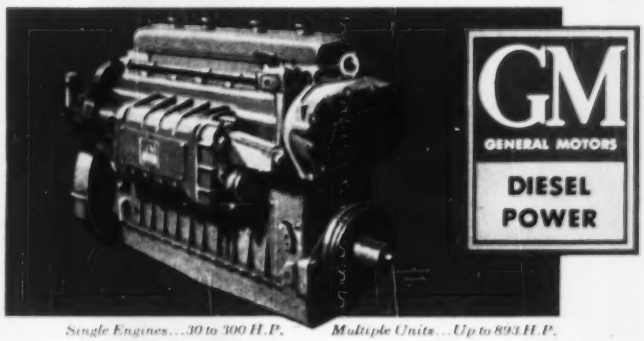
Diesel in Road building ?



Equipment shown includes: Blaw-Knox MultiFoote paver and spreader; Koehring Dumptors; Cedarapids rock crusher; Link-Belt and Unit shovels; Ingersoll-Rand air compressor; LeTourneau-Westinghouse Tournapull and Pettibone Mulliken front-end loader. Write us for complete list of over 1000 GM Detroit Diesel power applications.



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By adding Columbia Calcium Chloride to your Ready Mix in cold weather, you get faster set, accelerated early strength. Forms can be removed and re-used days sooner. The whole construction job moves along ahead of schedule.

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1. Under normal conditions, the initial set is reduced from 3 hours to 1 hour. The colder the weather, the greater are the effects of Columbia Calcium Chloride.
2. The final set is reduced by the same ratio—from 6 hours to 2 hours.
3. The early strength of concrete cured with Columbia Calcium Chloride is as great in one day as plain concrete is in 2 days. In 3½ days it has the strength equal to untreated concrete of 7 days!
4. The ultimate strength increases substantially. Tests by impartial testing organizations show an increase of 10 percent in 5 years when calcium chloride is used in the mix.
5. Integral curing is improved. Columbia Calcium Chloride establishes favorable conditions for hydration during the setting and hardening period of concrete, despite adverse conditions of low humidity.

Summer and winter, you benefit greatly from Columbia Calcium Chloride in your concrete—the colder the weather the more pronounced are the advantages.

Columbia Calcium Chloride is not an anti-freeze, however, and it should not be considered as such. Normal cold weather protective measures should always be followed, but the addition of calcium chloride greatly reduces the protection time—often from 7 days to 3 days.

Columbia Calcium Chloride may be added to the mix at the plant or on the job site. It is available in REGULAR FLAKE, 77-80%, and the new HIGH TEST FLAKE which runs 95-98%.

For more information, write today to Calcium Chloride Department at our Pittsburgh address.

BOOTHS 61-62

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All of Cuba to Be Mapped By Aerial Photogrammetry

The entire island of Cuba is to be mapped by air.

The two-year survey, stated to begin this month, will cover approximately 45,000 sq mi, making it one of the largest topographic mapping projects by aerial photogrammetry.

It also will make Cuba the first country in the western hemisphere to have such a complete, detailed map coverage for all its land.

Taking the aerial photographs to be used for the maps will require two mapping seasons, with two modified P-38's flying at 30,000.

Photo information will be tied to a network of geodetic control, the primary control being bench marks. Photos will be viewed in stereoplotters and contour maps drawn. Scale of the maps will be 1:50,000 with a 32.8-ft (10-meter) contour interval.

According to Aero Service Corp. of Philadelphia—which will do the survey—324 six-color map sheets, each 20 by 15 in., will be compiled to cover the island; 5,500 sets of map sheets will be made.

Canadian Irrigation Plan Delayed by Rising Costs

Rising construction costs have washed out hopes of Alberta's East Central Irrigation Association for a prompt start on the long-proposed Red Deer River Irrigation project, which would have fertilized 500,000 acres of land.

At its annual meeting the association was told by L. C. Halmrast, Alberta's Minister of Agriculture, that the project must await completion of current similar projects before consideration is given to a positive start.

Despite this stand, the group passed two resolutions urging speedy action.

The 30-year-old irrigation plan, strongly endorsed by farmers and ranchers in East Central Alberta, was estimated in 1951 to cost $25 million. Now it might cost some $45 million, according to Halmrast.

Just Like It Was Four Centuries Ago

Stone by stone the famous Santa Trinita Bridge over the Arno at Florence, Italy, is being rebuilt in its original image after being wrecked by the Germans in 1944. The decision to rebuild, rather than replace with a more modern structure, was won only after a long controversy in which a local architect, Riccardo Gizdulich, aided by a $100,000 gift collected by a committee headed by U.S. art critic Bernard Berenson, emerged the victor.

Only about 10% of the 40,000 individual stones required for the bridge could be recovered from the river. The remainder will be new, taken from an old quarry in the nearby Boboli Gardens, which may have been the source of the original stones. The stone cutting diagrams are being taken from a notebook that happily, was preserved, dating from the time the original bridge was built in 1566 by the Florentine architect, Ammannati.

Ponte Santa Trinita will be completed next summer, and none too soon, for Florence, which suffered the loss of all of its river crossings except the Ponte Vecchio, has been a city divided since the end of the war.

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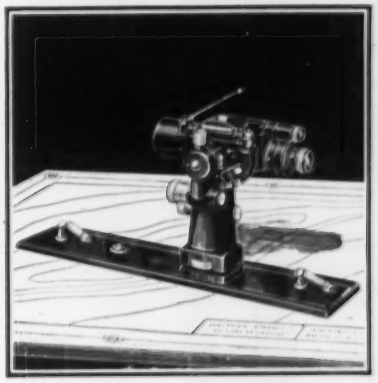

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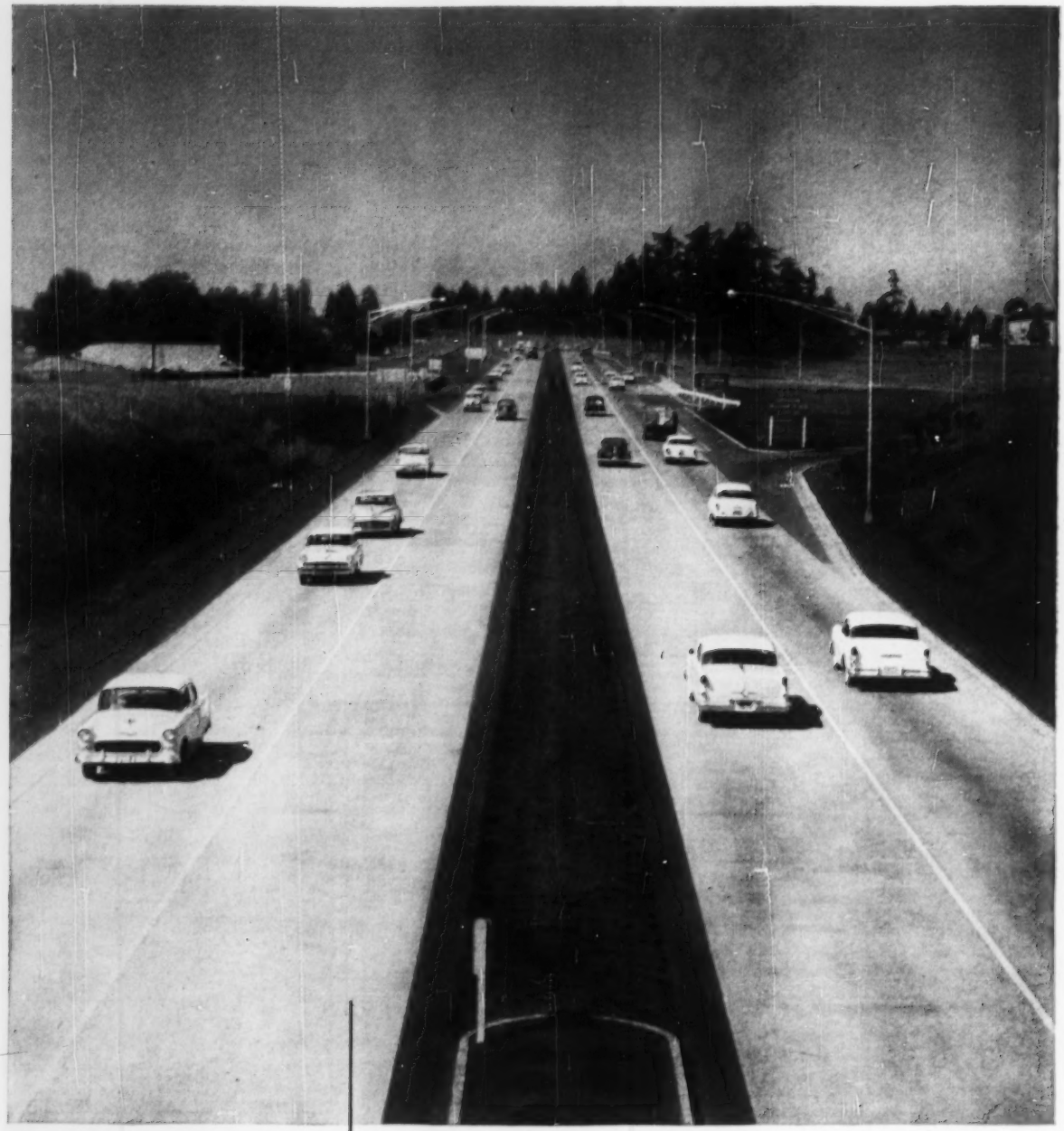

DESIGNED FOR SAFETY

Limited access and elimination of cross traffic at grade, as illustrated in this scene on U. S. 99 near Vancouver, Wash., are two of the important safety features being designed into vital new roads such as the National System of Interstate and Defense Highways. By choosing concrete you deliver the safest possible road because concrete's combination of high skid resistance and high light reflectance value is unequalled.

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work.

Drill Design Key to Lower Soil Testing Cost

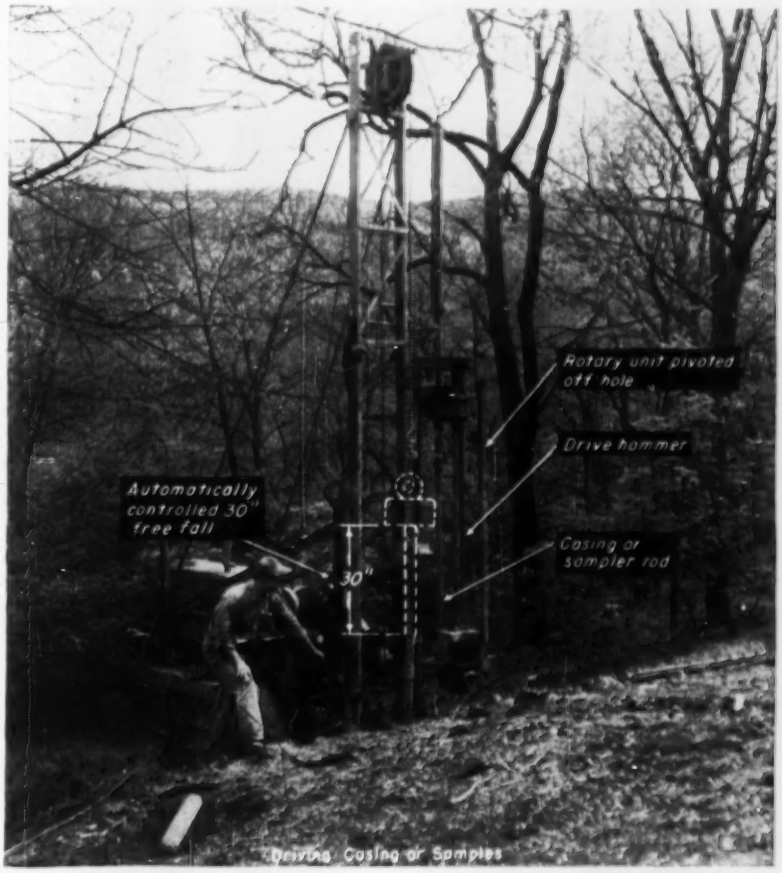
Test borings are neither a cheap nor a simple device for subsurface investigation. But a new drill rig designed specifically for bore holes makes their drilling cheaper and simpler.

The complications of obtaining borings are many. Drilling for sampling is quite different from ordinary drilling. It should be done without the contamination of drilling fluid. It must be done through stiff soils, loose soils, bouldery soils and rock. Holes are usually shallow, averaging about 40 ft. Fancy drill site preparations are prohibitive for the short set-up time over such shallow holes.

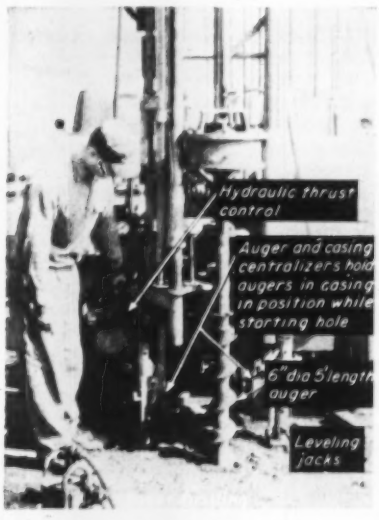
To meet these conditions, a versatile new drilling rig called the Testborer has been developed. It can auger in stiff soils, drive casing in loose soils and function as a core drill in rock. It can change from one drilling method to another quickly and easily. Trailer mounted and mobile, it has an integral derrick and leveling device for quick set-up. And it has the means of obtaining accurate testboring information.

Specifically, since the most common and widely used sampling method is driving the split-tube sampler to determine the relative penetration resistance, the drill incorporates means to drive the sampler automatically and with constant and uniform blows.

The Testborer has a hydraulically actuated 6-ft feed rotary unit with a spindle speed range from 70 to 1,100 rpm. In low gear and equipped with 5-ft augers, the drill can auger drill efficiently. And when in high gear, ample torque and speed is available for core drilling into rock.



MULTIPLE UNIT TESTBORER drives casing with ease with drill units pivoted out of way


Hydraulic thrust control
Auger and casing centralizers hold augers in casing in position while starting hole
6" dia 5' length auger
Leveling jacks

WITH SPINDLE SPEED in low gear versatile unit auger drills in stiff soil with ease

A long hydraulic-thrust mechanism permits pressing thin wall samplers into soils in one even stroke.

To achieve a driving mechanism that would insure a constant length and free fall of the drive hammer regardless of the number of blows per minute, a churn-drill spudder beam principle was modified to actuate by cam rather than by the conventional crank arm and pitman. This modification permits the spudder beam to gravity-fall away from the drive cable allowing the hammer to free-fall. Without this modification there would be a retarding action imposed by the crank arm and pitman, particularly when the spudder beam operated at low speed.

A patented automatic indexing arrangement provides a constant length of fall regardless of the depth to which the tools advance in the hole per blow. The driving arrangement, when used to drive pipe or casing, is faster and more efficient because it substantially reduces the physical labor of driving. On the other hand, when used to drive split-spoon samplers it greatly increases the accuracy of sampling by eliminating the human element of error.

The Testborer was put into service in August, 1955, and has been operating almost continually on testboring jobs ever since.

A typical job was subsurface testboring for the Pennsylvania Department of Highways, a project on which Groff & Myers were consulting engineers. The borings consisted of approximately 59 holes of variable depth. Four-inch casing was driven through the overburden, the number of blows required to advance the casing each foot being recorded. When bedrock was encount-

OPERATOR ADJUSTS diamond drilling unit speed as testborer drills through rock strata

cred, the borings would extend 10 ft were taken every 3 ft in the overburden.

Three drills were required to complete the job within the specified time. One was the Testborer, while the other two were core drills equipped with hoisting drums and cat-heads, both standard types.

The Testborer, driving the casing with the automatic driver, and then coring into the rock, averaged 26.3 ft into the rock. Samples from the casings per shift. The core drills averaged 20.5 ft and 20.6 ft, respectively. All averages included moves and set-ups. The greater flexibility and automatic driving means increased the Testborer's footage approximately 21% and thus reduced the drilling cost accordingly. PENNDRILL MANUFACTURING DIVISION, PENNSYLVANIA DRILLING CO., 1201-15 CHARTIERS AVE., PITTSBURGH, PA.

Electronic Ear Forecasts Rock Falls

An instrument to detect danger of rock falls has been designed in the research department of Liberty Mutual Insurance.

The device, called a Seismitron, makes use of the fact that rock falls usually are preceded by movements which produce sounds. But these sounds are inaudible to the ear until just before the fall. To pick up these faint sounds well before the rock fall is the job of the new device.

The probe of the instrument is placed in a drill hole about 3 ft deep. A synthetic quartz pick-up in the probe is affected by minute movements of the rock, producing electrical impulses. These are amplified by a battery-operated amplifier to the point where they can be heard through earphones.

The kind of sound heard is different for different formations and ores. Therefore, the operator must learn to distinguish the importance of the sounds he hears. The Seismitron now is being used on the Snowy Mountains hydroelectric project in Australia. Further information about the instrument and its use may be obtained by writing to F. J. Crandell, RESEARCH DEPARTMENT, LIBERTY MUTUAL INSURANCE COMPANY OF AMERICA, BOSTON, MASS.

Hydraulic Tester Applies Preset Load Up to 15 Tons

Soiltest announces a new multi-purpose compression testing machine for soils, asphalt, mortar, concrete, plastics, metals, wood, ceramics and other materials.

Reportedly accurate to within 1% of indicated load, the machine—called the Versa-Tester—is designed for both routine and research testing in compression and flexure.

Available with either English or metric calibration, the Versa-Tester has a load capacity of 30,000 lb. It complies with the hydraulic testing machine specifications of the American Society for Testing Materials, and a calibration certificate accompanies each machine.

The unit accommodates test specimens up to 12 in. wide and 18 in. high. It can be preset to apply a particular maximum load, a convenient feature in repeated proof loading. Loading rate is adjustable up to 6 in. per min.

Overall height of the machine is 72 in. Working parts are enclosed in a two-tone grey steel cabinet, with removable back and front panels for access to the mechanism. Required floor area is 28x24 in. The machine costs approximately $1,600. SOILTEST, INC., 4711 W. NORTH AVE., CHICAGO 39, ILL.

Stretchproof Drawing Paper Features an Aluminum Filler

Drawing and photographic paper are laminated to stretchproof, shrinkproof aluminum in an import from a Swiss firm, Elsaesser Technical Papers, Ltd.

Cadastral maps, plane table sheets, photogrammetric surveys and other drawings in which a high degree of dimensional stability is important are the special domains of the several types of the product. One kind is made for field use, another is suitable for printed maps, some are flexible, and two are coated with a silver bromide emulsion for photographic use. There is none of the distortion, according to the manufacturer, that paper usually undergoes when subjected to atmospheric changes and mechanical stress.

The aluminum layer varies in thickness, among the different types, from 0.1mm to 1.3mm. Sheet sizes range up to 39x58 in. Manufacturer's representative: GEO-OPTIC CO., INC., 170 BROADWAY, NEW YORK 38, N. Y.

Publications

Pipeline computing – A four-page folder describes how a complex construction problem on a natural gas pipeline was solved with a Bendix G-15D electronic digital computer. The problem was to determine source and destination pressures over a 300-mile pipeline. Equations used and input information are shown. Formulas for gas flow and calculating brake horsepower for reciprocating and centrifugal compression were involved. BENDIX COMPUTER DIV. OF BENDIX AVIATION CORP., 5630 ARBOR VITAE ST., LOS ANGELES, CALIF.

Clay products—A four-pager, AIA 29-B-5 portfolio contains basic clay product information for architects. Illustrated, it offers data on heating and ventilating ducts, chimney flue lining, clay pipe fittings, perforated drainage pipe, sewer and waste line pipe. Application ideas also are included. CLAY SEWER PIPE ASSN., 311 HIGH LONG BLDG., 5 E. LONG ST., COLUMBUS 15, OHIO.

Concrete bonding agent—Larsen Products Corp. has issued a new four-page folder on Weld-Crete, a liquid designed to bond new concrete to old surfaces of concrete, brick, gypsum board, metal and other materials. Characteristics and strength of the material, how to specify it and how to apply it are included, along with photos of actual installations. Larsen Products Corp., 4934 Elm St., Bethesda, Md.

Aluminum stock—A 16-page bulletin lists sizes and weights of rod, bar, sheet, coil, plate, tubular and building products of aluminum carried in stock. Cutting facilities, finishes, mechanical properties and a guide to selection also are included. JOSEPH T. RYERSON & SON, INC., BOX 484, JERSEY CITY 3, N. J.

Crawler crane—A 4-page bulletin describes the crawler-mounted Model C-35 Bantam. The new bulletin, No. C-101, contains detailed information concerning specifications, features, capacities and application data for the crawler-mounted ¾ cu yd, 5-ton crane-excavator model. SCHIELD BANTAM CO., WAVERLY, IOWA.

Snow melting—A new technical bulletin describing Ice Rem-CE, the chloride free ice and snow melting material has been announced. The bulletin discusses physical and chemical characteristics of the product and the effects these have on various surfaces. SPECO, INC., 7308 ASSOCIATE AVE., CLEVELAND 9, OHIO.

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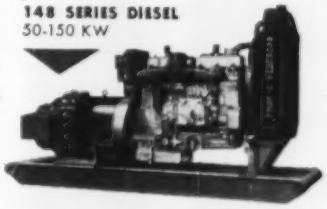
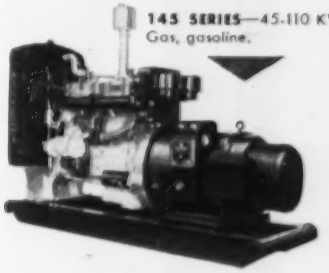
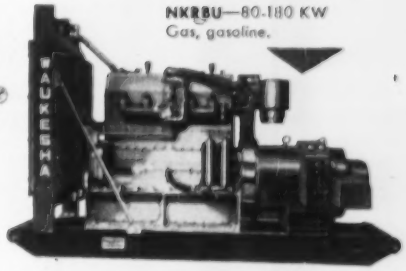


145 SERIES—45-110 KW
Gas, gasoline.

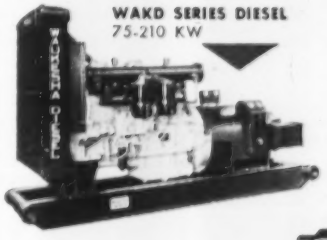


WAK SERIES—75-170 KW
Gas, gasoline.

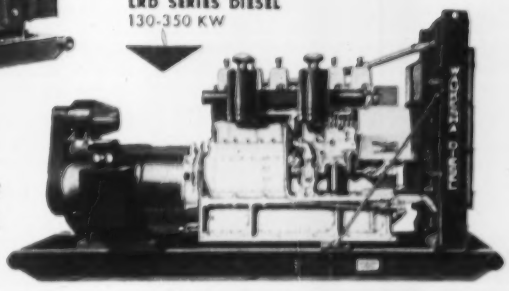
NKRBU—80-180 KW
Gas, gasoline.



WAKD SERIES DIESEL
75-210 KW



LRD SERIES DIESEL
130-350 KW



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WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN RAILWAY DIVISION

New Job for Bacon

Bonderson succeeded him in California pollution post

This week, Vinton Bacon left his post as executive officer of the California State Water Pollution Control Board and opened offices in Tacoma, Wash., as executive secretary of the newly formed Northwest Pulp & Paper Association.

Succeeding him in California is Paul R. Bonderson, who leaves a position as executive officer of the Central Coastal Regional Water Pollution Control Board (headquartered in San Luis Obispo). Under the California setup, the state board coordinates the activities of nine regional boards that have the actual enforcement authority.

Bacon, who has served as the state board's only full time executive officer for the past six years, joins an organization formed by 16 pulp and paper companies in Washington and Oregon. This association aims to "acquaint the public" with the significance of the pulp and paper industry in the Pacific Northwest and also will finance research in the fields of water and air pollution abatement.

The Northwest Pulp & Paper Association intends to cooperate with all other research organizations in these fields, including the National Council for Stream Improvement which is supported by all of the Northwest association founders.

Bacon is a University of California sanitary engineering graduate who is regarded as the prime mover behind California's exemplary pollution abatement program. The difficult job of filling his shoes goes to a 37-year-old civil engineer from the same school. Bonderson has been executive officer for the regional pollution board for six years and before that served with the State Department of Health's Bureau of Sanitation and with the San Francisco Water Department.

Blanchard Gets High Award For Outstanding Topo Work

Robert G. Blanchard, long-time topographic engineer in the New Jersey Department of Conservation and Economic Development, recently received one of the state's highest awards for professional achievement. He is shown with Gov. Robert B. Meyner (right) at the time of the presentation.

Blanchard received a bronze plaque in recognition of outstanding achievement in the field of topographical engineering. It was presented by The New Jersey State Employees Awards Committee.

He was instrumental in preparing county index maps of monuments and bench marks which, according to State Geologist E. Johnson, have made New Jersey outstanding for the ease with which engineering work involving locations, distances and elevations may be done.

Blanchard recently retired after serving since 1943 in the Department of Conservation and Economic Development. Prior to that time, and beginning in 1927, he was a member of the state highway department. Since his retirement he has been active as a consulting engineer in Trenton.

Contractor and Army Engineer Honored at San Francisco

The Building Industry Conference Board of the San Francisco Bay Area at its annual awards dinner Nov. 8 singled out Alfred B. Swinerton of the general contracting firm of Swinerton & Walberg and Brig Gen. W. F. Cassidy, South Pacific Division Engineer of the Corps of Engineers for its 1956 achievement awards.

Swinerton is believed to have the longest record of construction practice in the area as attested by his California contractor license number of 94. Current license numbers approach 70,000.

General Cassidy's award stemmed from his leadership in directing rehabilitation work following the devastating floods of a year ago.

Road Department Official To Join Engineering Firm

Howard S. Ives, deputy commissioner of the Connecticut State Highway Department, has resigned his post and plans to accept a position with a private engineering firm.

A native of New Haven, Conn., Ives joined the state highway department in 1919, but left in 1922 to join a private company. He returned to state work in 1926 and has been with the department ever since, except for two terms of military service during World War II and the Korean War.

M & J Briefs . . .

• **Careers—Max J. Kennard,** who has been serving as vice president in charge of sales and development for Combined Metals Reduction Co., Salt Lake City, has been appointed chief engineer of the engineering and construction division of Southwestern Engineering Co., Los Angeles. **Retirements—Lambers J. Bodeewes,** after 42 years with Joseph T. Ryerson & Son, Inc., steel distributors. . . . **Thomas J. Lovell,** supervisory electrical engineer in the Bureau of Reclamation's engineering offices in Denver, after 25 years of government service. . . . **Paul N. Snell,** former head of the construction division of the Wilmington, N. C., office of the Corps of Engineers, after 42 years of service with the Corps.

Obituaries

Charles H. Tompkins, 73, founder and head of the Charles H. Tompkins Construction Co., Washington, D. C. died Dec. 12 in Washington.

Although born in Baltimore, Tompkins attended the public schools in Washington and spent most of his life in the capital. In 1902 he won the only scholarship awarded to the Washington public schools by Lehigh University.

Financial troubles and poor health caused him to drop out of Lehigh in 1904. Later, however, he took evening classes at George Washington University. Years later, he donated the Tompkins Hall of Engineering to George Washington and was named a trustee of the university.

Tompkins and his wife founded the construction company in 1906. From such small beginnings as a few hundred dollars in capital and a $6 repair contract, the firm grew to become one of the biggest builders in the country. Its Washington jobs included such well known projects as the new United States Court House, the East and West Executive Offices of the White House, the National Guard Armory, and the Lincoln Memorial Reflecting Pool.

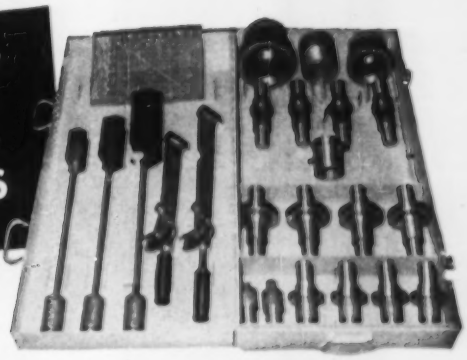
The company also remodeled the Eisenhower farm home in Gettysburg, Pa.

Frank Mizell, 75, retired civil and building engineer of Aberdeen, N. C., died Nov. 27. After receiving his civil engineering degree from Georgia Institute of Technology, he went to Yucatan, Mexico, where he served as a captain in the Corps of Engineers during World War I. Except for eight years with a private engineering firm, Mizell was, until his retirement in 1948, an inspection engineer for the federal government.

Markham Cheever, 76, former president of Ebasco International Corp., died Dec. 5 in New York City. A 1903 graduate of the University of Michigan, he served as chief engineer and plant manager of Utah Power and Light Co. and in 1926, joined Electric Bond and Share Co. in New York. Cheever became president of Ebasco International in 1944 and retired in 1947.

Edgar H. Wilson, 64, founder of the Trenton, N. J., contracting and engineering firm of E. H. Wilson Associates, died Dec. 9 at Flemington, N. J. He was also a former executive of Eastern Construction Co., Trenton, and founder and former president of Dural Rubber Co., Flemington.

"IN-PLACE" SHEAR READINGS



FAST, ACCURATE, WITH NEW ACKER VANE TEST KIT!

The Acker Vane Shear Test Kit has everything needed to obtain fast, accurate, "in-place" shear readings to depths of 100 feet!

It's easy to use and provides accurate soils information at low cost! For easy carrying, the entire set of tools are packaged in a handy steel kit.

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Insert in Casing and Apply Pressure to the Torque Wrench!

Consult the Torque Chart for Accurate Reading!

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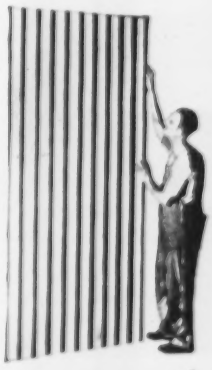
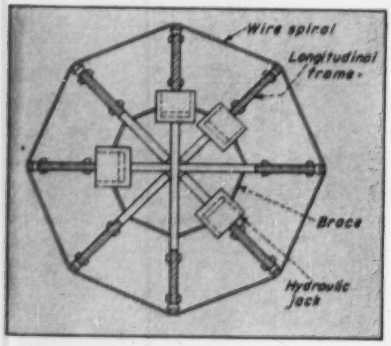
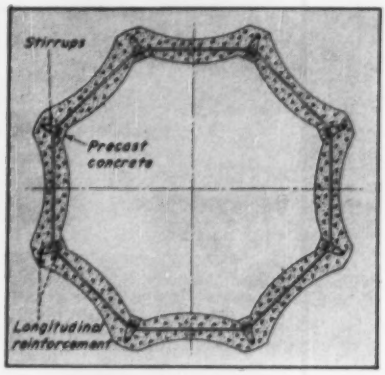
- *Easy to nail to wood*
- *Easy to saw and drill*



Johns-Manville





JACKS stress wire wrapped around inside forms (above) to produce eight-sided pipe.

New Way to Prestress Pipe

By Dr. Rolf Schjodt
Oslo, Norway

A simple method of prestressing, casting and curing precast concrete pipe, making on-site fabrication feasible, has been developed by the author. It replaces the relatively costly machines that wrap stressed wire around circular concrete cores with simple hydraulic jacks.

The pipe is designed as an eight-sided polygon. The concave shape of the sides permits the stressed wire to be located close to the interior surface, where the wire changes direction, thus inducing compression to resist tensile stresses caused by the change in wire direction and by the liquid in the pipe. Along the straight portions of wire, concavity of the concrete gives the proper eccentricity to the wire so that it induces bending stresses of opposite sign to those that are caused by liquid pressure.

To produce the pipe, unstressed wires are wound around a longitudinal steel frame and then are stressed by a series of hydraulic jacks radiating out from the center. Steel forms are placed and concrete is cast.

As soon as the concrete can hold its shape, the forms are moved a few inches away from the pipe without releasing the wires. The annular spaces obtained are used for steam curing. It is possible to release the prestress after only 12 hours with this type of curing.

If desired, only the outside chamber need be used for steam and then the interior forms can be welded to the longitudinal frame bars. The interior forms also can pass continuously over the frame bars and become part of the pipe, later to be protected by a mortar layer.

These procedures permit continuous manufacture; the last finished section is underpinned and one end of the jacking frame is supported inside. Continuous longitudinal prestressing also can be accomplished easily.

A firm known as Continental Enterprises, Evanston, Ill., will license interested firms in the United States and provide consulting service as desired.

Who and How Many

Tests disclose acoustics of the theater audience

Noting the effect of occupancy on theater acoustics, the Division of Building Research of the National Research Council, Ottawa, is conducting tests to determine:

- Feasibility of acoustic patches on chair upholstery to equalize the "occupied" and "unoccupied" sound absorption.
- Whether sex of the audience has any acoustic significance.

These were among preliminary observations:

- Absorption of sound by an audience is largely influenced by the type of clothing.
- Men and women audiences are acoustically similar.

Noting also that very little information exists on the acoustic properties of materials not designed specifically for such qualities, the experimenters are currently running sound-absorption tests on furnishings and various building materials.

Electronic System Analyzes Boilers

An electronic system that analyzes the operation of a steam generating unit in a few hours—a task ordinarily requiring weeks of work—has been developed jointly by Babcock & Wilcox Co. and Bailey Meter Co.

Sensing elements for temperatures, pressures, gas composition and the like are attached to hundreds of different boiler parts. When called upon, they deliver information to electronic devices that punch it in code on tape.

Tape readings are transmitted by teletype to New York City, where the boiler company has a large electronic computer. The information is processed and transmitted back to the boiler site for application by engineers and technicians.

The new system was developed to help engineers determine quickly and economically such boiler data as sources of heat losses, the most efficient types of fuels, and when and where to remove combustion waste deposits. The emphasis is on the need for a method of correcting material or operating faults promptly. But the system also represents an effort to conserve short engineering manpower.

Heart of the system is a centrally-located electronic coordinating unit at the boiler site, which has a special "scanning" device enabling it to gather data from the sensing elements. Any number of these devices may be hooked up with the system, depending on the quantity and location of points from which information is desired.

Recently the system underwent performance tests at the West Penn Power Co.'s Springdale, Pa., station, where it was used to gather data from 140 points on a boiler. When it is applied later this year to the first of three steam generating units now being built at the Ohio Power Co.'s Philo plant, near Zanesville, data will be gathered from 500 different locations.

Spokesmen for Bailey Meter Co., which plans to make the new equipment available commercially if it proves successful, say that the system is designed primarily for large steam generating units. However, it may be adaptable to smaller boilers or boiler elements and capable of being moved readily from one boiler to another.

In future tests, the system will be applied to a broad range of equipment. It may shed new light, for example, on the combined operating efficiency of turbines and auxiliary equipment used in conjunction with boilers.

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This network of ramps, takeoffs and highway composes the three mile stretch of New Jersey Turnpike extension worked by Geo. M. Brewster & Son, Inc.

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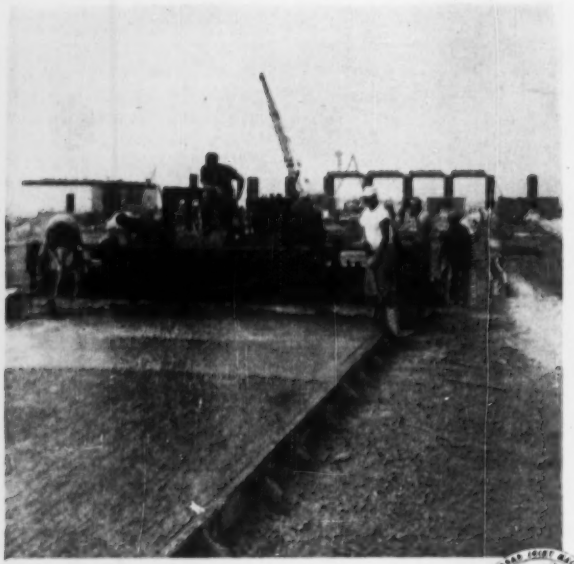
REMARKABLE SELF-WIDENING FINISHER MAKES SMOOTH WORK OF COMPLEX HOLLAND TUNNEL EXTENSION OF JERSEY PIKE!



▲ Flex-Plane's Triple Lap Frame provides unsurpassed steadiness even at its widest width. Here machine works 23' slab in extended position.

"There's only one machine that could have done this job," states Byron Craig, Paving Superintendent of Geo. M. Brewster & Son, Inc., "and that is Flex-Plane's Self Widening Finisher."

The job Byron Craig was talking about is the Newark Bay-Hudson County Extension of the New Jersey Turnpike, a three mile stretch of ramps, turnoffs, interchange lanes and service area cutoffs that connects the busy toll road with the Holland Tunnel.

"This job was a real challenge," continues Craig, "A typical pour would range from 4' to 14½' to 19', back to 15'-8", then up again to 23'. The Flex-Plane Self Widener worked these variable width slabs as easily as though it were a straight pour. What's more I find Flex-Plane builds a 'paving man's' machine. It's strong and sturdy at its widest width, and it comes in a width selection that makes sense."

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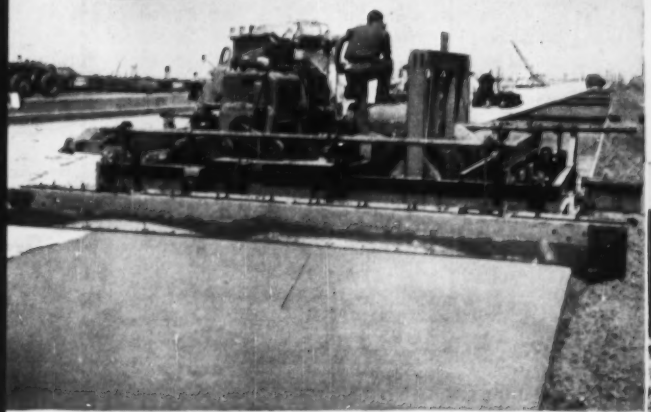

Typical slab section. Note unusual tapering. Brewster was able to maintain above average pour with a single Flex-Plane machine without a spreader.

Here machine works narrow take off strip in contracted position. Three mile stretch had 10 such strips plus 8 ramps and one underpass.

Byron Craig, Paving Superintendent, shows type of progress chart he used to map pours.

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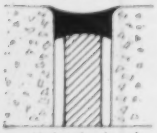

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PAVING TESTER is demonstrated in the Engineering Experiment Station of the University of Washington at Seattle. In the rear are Prof. Martin Ekse (left), in charge of the project, and Prof. Robert B. Van Horn, head of civil engineering. Studying graph recording data are Arthur Peters (left), assisting Professor Ekse on the project, and Leon M. LaCross, who developed the pressure cells and instrumentation.

New Type Paving Test Track

A new type of model test track for research on various highway pavement materials and design has been developed in the College of Engineering at the University of Washington in Seattle.

Miniature truck tires, mounted on an endless chain, apply variable loads at variable speeds to different types of paving and subgrade soils under laboratory controlled climate and moisture conditions.

University officials say this is the first model track for highway testing that has been constructed along a straight path. Circular tracks now in general use require large dimensions with greater amounts of subgrade, points out Prof. Martin Ekse of the University's civil engineering department, in charge of the project. Constant acceleration of the wheels on the circular path tends to rut the surface. Full-size test roads are costly and control of weather and soil conditions is impossible.

The model test track is mounted on an insulated metal tank 12 ft long, 3 ft wide and 3 ft high.

A highway subgrade has been constructed in the tank to simulate a portion of highway soil used in many roads. Water and refrigeration connections with the tank can be controlled to provide the desired temperature and moisture conditions. Soil-pressure measurements are made through electrically connected cells imbedded in the soil at varying levels, with the pressures recorded automatically on a graph and an oscillograph tube.

Experiments will be conducted with portland cement concrete and asphaltic pavements constructed to state highway department standards.

Pavement deflections and the variance in soil-pressure distribution will be studied under various conditions of pavement thickness, subgrade moisture and soil types.

The equipment can provide a comparative analysis of any type of pavement, under any known conditions, according to Professor Ekse. "The research can deal with the effects of such variables as soil type or classification, moisture content, temperature, load intensity and load frequency."

Prestressed Girders for Texas Bridge

Corpus Christi Ship Channel Bridge in Texas, over a mile long, has 37 prestressed concrete girder spans, 10 steel girder and five steel truss spans.

Its two 36-ft roadways are separated by a 4-ft median. On each side is a 3-ft-wide pedestrian curb with railing.

Navigation on the Ship Channel requires 140-ft clearance.

Work is for the Texas Highway Department in Austin. Lewis H. White is senior field engineer in Corpus Christi and Randle B. Alexander is bridge engineer for the department.

The whole project is to be let in four separate contracts. Prices on the first two are shown here:

The $1,386,566 contract to Cage Brothers, San Antonio, Tex., for the 37 prestressed concrete girder spans with substructure is 6% below the second low of 12 bids and 6.4% below the engineers' estimate.

These spans each have 10 girders, 13 are 40 ft, 20 are 60 ft and 4 are 70 ft.

The $1,128,637 contract for 17 concrete bents and two piers to Guy James Construction Co., Oklahoma City, beat the second low of eight bids by 2.6% and the engineers' estimate by 13.8%. This substructure for steel spans is 0.791 mile long.

The engineers' estimate includes 10% for engineering and contingencies.

The entire substructure, two main piers, 54 bents and two abutments will be supported on concrete piling.

Three alternate bids for metal shell piles drew prices ranging from $8.75 to $11.00 per lin ft compared to $6.17 to $10.83 for precast concrete piles to support the prestressed girders. One alternate bid on the metal shell piles under the bents was $10 per lin ft against a range of from $4.75 to $8.50 for seven bids on concrete piles.

Another option for the contractors is the choice between 17-in. square precast, prestressed concrete piles or 18-in. square non-prestressed concrete piles. All piles used in the project shall be of the same type.

Special high strength concretes are required in prestressed girders and concrete piling. Class E concrete must contain 6.6 sacks of cement per cu yd, Class F 6.25 sacks, Class C-M 6 sacks and Class A-5 sacks per cu yd. Class F concrete must test at a compressive strength of 5,000 lb psi and at 800 lb psi flexural strength after seven days. Class C-M concrete shall test at 4,000 lb psi and 650 lb psi respectively.

Maximum slumps for machine vibration are 2 in. for class C-M and 1½ in. for class F concrete. ASTM standards required for concrete reinforcements include A-160 for axle steel, A-15 for billet steel bars and A-82 for cold-drawn steel wire.

Oyster shell embankments must pass 80% to 100% through an 2½-in. screen and 45% to 65% must be retained on a 40-mesh sieve.

Prevailing hourly wage rates are $1.25 to $1.65 for skilled labor, $1.00 to $1.30 for intermediate grade and $1.00 for unskilled labor.

Bidders on the two bridge contracts include:

Prestressed Concrete Girder Spans Length: 0.416 mile

1 C	Cage Bros., San Antonio, Texas — $1,386,566
2	Heidenfels Bros., Corpus Christi, Texas — 1,474,949
12	Kansas City Bridge Co., Kansas City, Missouri — 1,933,209
EE	Lewis H. White, Project Engr., Ship Channel Bridge, Corpus Christi, Texas — 1,629,260

Bids: 5-16-56 Items	Unit	Quantity	Unit Prices 1 C	2
ROW, prepare	sta	23.2	$2,500	$235.00
Shell embankment	cy	5,670	3.50	2.45
Excav, uncl struct	cy	1,905	4.00	4.75
Girders, prestressed conc 40'	ea	110	495.00	500.00
Trans girds, prestressed conc 40'	ea	20	495.00	500.00
Girders, prestressed conc, 60'	ea	200	1,000	1,015
70'	ea	40	1,500	1,220
Conc, cl A, slabs	cy	4,254.5	30.00	44.00
bents	cy	4,351.7	43.00	44.00
Steel, reinforcing	lb	1,294,631	0.11	0.11
structural	lb	378,470	0.445	0.45
Piles, precast conc	lb	48,031	7.00	8.20
Test piling, precast conc	lf	1,432	7.00	17.00
Pile Load test set-ups	ea	2	500.00	1,200
Riprap, conc, cl B	cy	18.0	35.00	35.00
Conduit, rigid met, 1¼" dia	lf	4,000	0.50	0.60
1½" dia	lf	75	1.25	0.47
Field office & laboratory	ea	2	600.00	1,500
Alternate Metal shell piles	lf	48,658		....
test piles	lf	760		....

Time to complete: 480 calendar days
Liquidated damages: $75 per day

Reinforced Concrete Bents and Piers Length: 0.719 mile

1 C	Guy H. James Const., Oklahoma City, Okla. — $1,128,637
2 C	F. Lytle Co. & Elmer C. Gardner, Inc., Houston, Texas — 1,158,861
8	Austin Bridge Company, Dallas, Texas — 1,494,619
EE	Lewis H. White, 405 Belden St., Corpus Christi, Texas — 1,430,500

Bids: 10-17-56 Items	Unit	Quantity	Unit Prices 1C	2
ROW, Prepare	sta	33.4	$2,000	$3,000
Uncl struc excav piers	cy	3,770	9.00	6.00
bents	cy	3,900	4.00	2.80
Class A conc	cy	9,465.5	38.50	35.00
E seal	cy	346.1	20.00	20.00
Reinforcing steel	lb	1,095,487	0.145	0.16
Precast conc piling	lf	68,885	6.00	6.20
test piling	lf	1,601	8.00	8.50
Pile load test set-ups	ea	2	500.00	600.00
Stl sheet piling	sf	22,000	2.50	2.90
Alternate Metal shell piles	lf	69,978		
test piles	lf	420		

Time to complete: 450 Calendar days
Liquidated damages: $75 per day

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- Wage Rates, Building Board, Lath, Insulation: Last, Nov 29; Next, Jan 3, 1957
- Cement, Aggregates, Ready-mixed Concrete, Asphalt: Last, Dec 6; Next, Jan 10, 1957
- Iron & Steel Products, Pipe: Last, Dec 13; Next, Jan 17, 1957

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Atlanta	†	$83 00	$88 00	$77 50	$76 00	$79 50	$83 00	$81 00					$22 32	$27 24
Baltimore	‡	92 00	96 00	96 00	98 00	98 00	102 00	114 00			$170 00	$185 00	25 92	31 60
		105 00g	*105 00g*	*123 00g*	*123 00g*	*123 00g*	*125 00g*	*153 00g*	*$144 00*	*$144 00*				
Birmingham	†	86 00	88 00	81 00	88 00	91 00	96 00	111 00			115 00	160 00	21 78	26 58
		107 00	*107 00*	*103 50*	*106 50*	*106 50*	*111 50*	*110 00*	*107 00*					
Boston	±	101 00f	100 00f	104 00f	104 00f	104 00f	115 00z						25 92	31 60
		91 00m	*90 00m*	*113 00*	*113 00*	*113 00*	*121 00*	*125 00*	*153 00*	*156/158*				
Chicago	**	94 00	97 00	91 00	105 00	113 00	114 00	109 00			137 00	137 00	22 45	27 37
		102 00	*102 00*	*111 00*	*113 00*	*113 00*	*114 00*	*122 00*	*122 00*	*122 00*				
Cincinnati	*	101 25	102 50	90 00	98 25	103 00	111 50	119 50			141 75	141 75	25 00	30 48
		89 50	*90 50*	*98 25*	*99 75*	*101 00*	*101 25*	*121 50*	*121 50*	*121 50*				
Cleveland	**	91 00	92 00	99 00	97 00	97 00	97 00						25 37	30 93
				118 00	*103 00*	*103 00*	*103 00*	*150 00*	*150 00*	*156 00*				
Dallas	‡†	75 00	82 00	74 00	75 00	72 00	72 00	130 00			130 00	140 00	18 72	22 80
Denver	*	*Not in stock*		*135 00*	*135 00*	*135 00*	*140 00*	*160 00*	*160 00*	*160 00*			13 92	16 98
Detroit	‡	115 00	118 00	114 00	115 00	118 00	122 00				130 00		25 00	30 48
		125 00	*125 00*	*130 00*	*130 00*	*130 00*	*155 00*	*185 00*	*195 00*	*195 00*				
Kansas City	*	120 00	125 00	120 00	125 00	130 00	135 00						16 56	20 16
		130 00	*125 00*	*125 00*	*125 00*	*125 00*	*150 00*	*165 00*	*185 00*	*210 00*				
Los Angeles	‡	*95 00*	*95 00*	*95 00*	*95 00*	*95 00*	*120 00*	*150 00*	*150 00*	*150 00*			16 61ab	20 85ab
Minneapolis	#	*140 00*	*140 00*	*145 00*	*145 00*	*145 00*	*145 00*	*185 00*	*185 00*	*185 00*			19 89	24 25
Montreal	ab	92 00	102 00	92 00	92 00	110 00	128 00				123 00	123 00		
		180 00	*180 00*	*180 00*	*180 00*	*180 00*	*180 00*	*170 00*	*170 00*	*170 00*				
New Orleans	†	92 00	92 00	97 00	97 00	96 00	100 00	124 50			158 00	154 00	18 72	22 80
	†	*108 50*	*108 50*	*105 00*	*118 50*	*118 50*	*118 50*	*151 00*	*151 00*	*151 00*				
New York	‡	110 00	112 00	117 00	122 00	122 00	122 00	165 00			240 265	240 265	25 92	31 60
				119 00	*122 00*	*122 50*	*124 00*	*165/175*	*165/175*	*165/175*				
Philadelphia	‡		Range from $117.00 to $137.00				117 137	117 137			214 224	214 224	25 92	31 60
			Range from $131.00 to $163.00				*131/165*	*156/158*	*165 00*	*165 00*				
Pittsburgh	2	130 00	140 00	130 00	155 00	140 00	145 00				155 00		25 92	31 60
		130 00	*140 00*	*130 00*	*155 00*	*140 00*	*145 00*		*200 00*	*200 00*				
St. Louis	#	113 00	115 00	123 00d	123 00d	123 00e	128 00e	128 00e					18 72	22 80
				129 00	*129 00e*	*129 00e*	*155 00e*	*189 00e*	*189 00*	*189 00*				
San Francisco	A	*81 00*	*81 00*	*83 00*	*83 00*	*85 00*	*85 00*	*120 00*	*150 00*	*140 00*			12 22	14 91a
Seattle	†	*58 00*	*72 00*	*72 00*	*72 00*	*72 00*	*74 00*	*90 00*	*90 00*	*90 00*				
Toronto	a	98 00	100 00	98 00	98 00	100 00	100 00				105 00			
		114 00	*117 00*	*128 00*	*130 00*	*130 00*	*140 00*	*150 00*	*140 00*	*145 00*				

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. sad., truckload lots, 8/8 Mfrbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 8M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8ft. lengths. *k No. 3 common. *n #3. A incl rail rate from North west mills to San Francisco are $11.50 to $18.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Interior Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ¾", $143.00; on ¼", $156.00. Exterior ¾", $148.00, ¼", $164.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a Lower rate by water shipment. *b 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Strength A quality	B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	77%c	78%e	$0.2540
Baltimore	74%d	76%d	.2540
Birmingham	82%	83%	.1990
Boston	72–10%	72–10%	.2540
Chicago	72%	72%	.2540
Cincinnati	74%	74%	.2540
Cleveland	74–2–10%	74–2–10%	.2940
Dallas	75%	75%	.2615
Denver	73%	73%	.2590
Detroit	74–10–10%	74–10–10%	.2540
Kansas City	76–10%	76–10%	.2590
Los Angeles	70%	76%	.2565
Minneapolis	71–10%	71–10%	.2590
Montreal	40–10–5%bc	40–10–5%b	22.05k
New Orleans	76%	78%	.2590
New York	79%	79%	.4425g
Philadelphia	74%	76%	.2540
Pittsburgh	73%	73%	.2540
St. Louis	76–10%	76–10%	.2590
San Francisco	60%	68%	.2540
Seattle	67%	70%	.2565

Price of 60% Ammonia Gelatin is $0.13 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, as, $42.78 for A quality, $37.80 for B quality; 14 x 20, ds, $60.00 for A quality, $52.78 for B quality. *b Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c 77% for single strength *d Discount 6/18/52. *e 77% for double strength

Explosives: *Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40% Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.2665	$0.3015	$0.3215
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.2715	.3065	.3265
Rocky Mtn. States	.2715	.3065	.3265
Pacific N. W. States	.2690	.3040	.3240
Pacific S. W. States	.2665	.3015	.3215

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	8-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	8-in.	50 to 69-ft.	50/83	....
14-in.—2-ft. from butt	8-in.	70 to 79-ft.	78/ 88	.93
14-in.—2-ft. from butt	8-in.	80 to 85-ft.	83/93	.94
14-in.—2-ft. from butt	8-in.	85 to 89-ft.	....	1.00
14-in.—2-ft. from butt	8-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		8" x 8" x 8' Untr.	8" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	* 4 2.10	3.18
	Grade 1	1.15	2.00	* 3a 1.70	2.78
Chicago	Red Oak		4.00a		4.80a
New York	S. L. Sap Pine	2.00d	4.00d	3.00g	6.00g
	Mixed Oak	2.50d	4.50d	3.50g	6.50g
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	White Oak	2.65		2.95	
	Red Oak	2.55	3.25a	2.80	3.60a
	Sap Pine or Cypress		3.15a		3.55a
San Francisco	Douglas Fir	2.03ef	2.95ef	2.84bef	4.31caf

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cal *d* 6 x 8 x 8'6" *e* Green. *f* f.o.b. cars. *g* 7 x 9 x 8'8" * Add 75¢/tie freight charge t° Birmingham.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

BITUMULS SOIL COVER holds mulch on new-cut banks

NOW... fast, low-cost erosion control

EROSION CONTROL has long been a problem for Roadbuilders where cut-and-fill is required in construction.

Now, thanks to the combination of effective spreading equipment and the holding power of Bitumuls® Soil Cover, this problem has been largely eliminated. Our engineers have developed Bitumuls Soil Cover specifically to combat this type of erosion.

The purpose of the Bitumuls Soil Cover Treatment is to "give nature a chance" after road construction has created . . . on cut or fill . . . an exposed area. Seed retention and growth on such areas is, under any conditions, slow and hazardous. Bitumuls Soil Cover with mulch creates an artificially-held bed for seed-development that resists the action of wind and rain.

Foremost in the equipment field are the machines of the *Finn Equipment Company, of Cincinnati, Ohio,* whose "Mulch Spreader" applies this special Bitumuls adhesive with straw mulch at the rate of one-and-one-half tons of straw per acre of exposed soil. Under average conditions, each ton of straw will require from 100 to 200 gallons of Bitumuls Soil Cover.

For full information on Bitumuls Soil Cover, call our office nearest you.

TESTED, PROVED, *SPECIFIED AND USED* on thousands of acres on the Ohio, Indiana and West Virginia turnpikes, Bitumuls Soil Cover offers these advantages to any Roadbuilders:

1. **Positive adhesion**
2. **Fast, economical coverage**
3. **Easy, uniform placement, even on steepest slopes**

American Bitumuls & Asphalt Company

200 Bush Street, San Francisco 20, Calif.

Perth Amboy, N. J.
Baltimore 3, Md.
St. Louis 17, Mo.
Cincinnati 38, Ohio
Mobile, Ala.
San Juan 23, P.R.
Tucson, Ariz.
Inglewood, Calif.
Oakland 1, Calif.
Portland 7, Ore.

See you at the Road Show, Chicago, Jan. 28-Feb. 2; Booths 81-82, Materials & Supplies Section

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 27, January 3 Massachusetts

BUILDINGS—SLC

▲ Mass., Pittsfield — OFFICE—Berkshire Life Insurance Co., 7 North St., soon lets contract, 3 story, 94x268 ft. insurance office, South St. $2,000,000. Cram & Ferguson, 248 Boylston St., Boston, archts. CD 9/25.

HEAVY CONSTRUCTION—LB & CA

▲ CONNECTICUT—State Hy. Comr., State Office Bldg., Hartford,
Conn.—Frouge Constr. Co., 141 North Ave., Bridgeport, Conn., LB $2,704,010 (2 bidders) 8 toll stations; LB $1,888,672 (2 bidders) 5 toll stations at Greenwich, Norwalk, Stratford, West Haven, Branford;
Conn.—Associated Constr. Co., 1010 Weathersfield Ave., Hartford, Conn., LB $780,530 (3 bidders) 3 toll stations at Madison, Montville and Plainfield, all foregoing is for 8 toll stations on Connecticut Turnpike. Bids Dec. 10. CD 11/21.

BUILDINGS—LB & CA

▲ DeVries Constr. Co., 72 Albion St., Wakefield, Mass. CA Approx. $3,900,000. RESIDENTIAL DEVELOPMENT, 140 houses, "Winchester Estates" Ridge St., WINCHESTER, MASS. Winchester Development Corp., c/o contractor.

▲ Thomas Constr. Co., Inc., 93 Austin Ave., East Haven, Conn., LB $1,595,500 (5 bidders) Branford HIGH SCHOOL, BRANFORD, CONN. Town, Bd. Educ., Branford, Conn. Bids Dec. 5. CD 11/15.

▲ Standard Builders, Inc., 55 Airport Rd., Hartford, Conn., CA $1,500,000. 1 story 15,000 sq. ft. fuel systems LABORATORY, 6 test cells, rein.-con. const., EAST HARTFORD, CONN. United Aircraft Corp., 400 Main St., East Hartford, Conn. George H. Miehls, 345 New Center Bldg., Detroit, Mich., archt. Awarded Dec. 3. CD 7/13.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲† Pennsylvania—BA 12/27—U. S. Eng., 2635 Abbottsford Rd., Phila., dredging Delaware River, Phila. Co., ENG-36-109-57-41. $3,000,000. CD 2/4/44.

▲† N. Y., Rome—HYDRANT REFUELING—BA On Or About 1/18—U. S. Eng., 111 E. 16 St., New York, Zone 3, hydrant refueling at Griffiss Air Force Base, $1,000,000-$3,000,000. Greenberg & Ames and William H. McFarland, 303 Fourth Ave., New York, Zone 10, engrs. CD 8/24.

▲† New York—BA 1/22—U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo, Zone 7, dredging South Cornwall Island Channel, St. Lawrence Seaway, St. Lawrence River, for St. Lawrence Seaway Development Corp., CIVENG 30-025-57-16. CD 10/1, under LB.

BUILDINGS—BA

▲ N. J., Atlantic City—HOSPITAL—BA 12/28—Atlantic City Hospital, 26 S. Ohio Ave., hospital, new wing and entrance bldg. $2,500,000. Extended date. Vincent G. Kling, 817 Corinthian Ave., Phila., Pa., archt. CD 11/9.

▲ Pa., Beaver—HOSPITAL—BA 1/10—Comrs. Beaver Co., Court House, 5 story, bsmt., 2½ story, bsmt., brick steel hospital and home for aged, $3,800,000. Plans deposit $100. Michael Baker Jr. & Assocs., P. O. Box 111, Rochester, engrs. CD 7/5/55.

▲ N. Y., New York—SCHOOL—BA 1/15—Director Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for P.S. 146, Cauldwell Ave. and E. 165 St., Bronx Boro. $2,000,000. Plans deposit $25 general constr., $7 each for mechanical trades. CD 1/16.

▲ N. J., Hopewell—SCHOOL—BA 1/21—Bd. Educ. Hopewell, 1 story, brick block, 83,000 sq. ft. high school, $1,600,000. Hankin Stull & Baakes, 495 W. Hanover St., Trenton, archts. Chester I. Duncan & Son, Lewis Tower Bldg., Phila., Pa., engrs. CD 2/28.

HEAVY CONSTRUCTION—LB & CA

▲ Hoffman & Elias, Inc., and Nager Electric Co., 254 W. 31 St., New York 1, N. Y. CA $1,529,639. (4 bidders) furnishing, installing, conduit, wiring and misc. electrical equip. for Third Avenue sub-station N. Y. C. T. S. Contr. P-173, BROOKLYN, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 10/24, under LB.

▲ Joseph Meltzer Associates, Inc., and Rosoff Bros., Inc., (joint venture), 369 Lexington Ave., New York 17, N. Y. LB $4,245,936. (5 bidders) platform extens. to 50, 59th and 66 Sts. Stations of Broadway 7th Avenue Line Manhattan Boro, Contr. C-118, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Dec. 11. CD 11/30.

▲ Rao Electrical Equipment Co., Inc., Arc Electrical Constr. Co., Inc., and Poirier & McLane Corp., 314 E. 39 St., New York 16, N. Y. (joint venture) CA $3,426,000, (5 bidders) furnish, install- Brooklyn portion 69 kv underground transmission sys., 59 St. sub-station to Third Ave. sub-station, Manhattan and Brooklyn, Contr. P-192, NEW YORK, N. Y. New York City Transit Auth., 372 Jay St., Brooklyn 1, N. Y. CD 9/26, under LB.

▲ Westinghouse Air Brake Co., 350 Fifth Ave., New York 1, N. Y. CA $9,395,000. (2 bidders) furnishing, installing brick signalling and interlocking equip. for Broadway-7th Avenue Line 34 St. interlocking to 96 St. interlocking IRT Division, Manhattan Contr. S-91, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 11/21, under LB.

▲ PENNSYLVANIA—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Pa.—Fort Pitt Bridge Works, 212 Wood St., Pittsburgh 22, Pa. LB $4,121,182. (3 bidders) superstructure for viaducts on eastbound and westbound parkways, 28 ft. and 40 ft. in width, parapet railing on existing retaining walls, also the superstructure work and parapet railing constr. on four ramps, portion of Downtown Interchange of the Parkway, U. S. Rtes. 22 and 30, Allegheny Co.;
Pa.—United States Steel Corp., American Bridge Div., 1236 Suburban Station Bldg., Phila 3, Pa. LB $6,895,851. (2 bidders) paving decks and sidewalk of main span of Fort Pitt Bridge and constr. of superstructure of the north and south approaches, incl. ramps, covering 0.49 mi., U. S. Rtes. 22 and 30, Allegheny Co.;
Pa.—Charles A. Imel & Sons, 200 Grand Ave., Clarion, Pa. LB $230,771. (6 bidders) two prestressed precast rein.-con. bridges, flexible base with bit. surf. bridges over Tionesta and South Tionesta Creek, north of Warren-Forest County line and vicinity of Barnes, 0.53 mi., T.R. 66, Warren Co. Bids Dec. 7. CD 11/15.

▲ PENNSYLVANIA—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Pa.—Ralph Myers Contg. Corp., Box 125, Pitcairn, Pa. LB $941,806. (9 bidders) flexible base, bit. surf. concrete divisors and traffic island for channelizing intersections, repairs to existing bridge, extends for a distance of 3.15 mi. from a point 4.3 mi. north of McCleary to a point 2.2 mi. from Monaca Boro, T.R. 18 and 51, Beaver Co.;
Pa.—J. Robert Bazley, Inc., P.O. Box 298, Pottsville, Pa. LB $2,232,086. (7 bidders) divided hy., rein.-con. five rein.-con. concrete structures, two prestressed precast bridge, bit. surf., two I-beam bridges, relocation and constr. of intersecting twp. roads and service roads, 11,691 ft., location between Krumville and Lehartsville Boro, T.R. 22, Berks Co.;
Pa.—McCormick Contg. Co., Inc., 22 N. Grove St., Lock Haven, Pa. LB $129,434. (5 bidders) resurf. wid'n., 0.48 mi., South Renovo Boro and vicinity, L.R. 18004, Clinton Co.;
Pa.—New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa. LB $348,422. (6 bidders) wid'n., resurf. 1 concrete bridge from a point in Three Springs Boro, north to near intersection of L.R. 31023, 5.19 mi., L.R. 31017, Huntingdon Co. Bids Dec. 7. CD 11/15.

▲† Atlantic Gulf & Pacific Co., 15 Park Row, New York, N. Y. CA $3,476,794. dredging approx. 3,183,000 cu. yd. Delaware River, Bucks Co., ENG-36-109-57-16, PENNSYLVANIA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 11/23, under LB.

▲† Western Contg. Corp., 400 Benson Bldg., Sioux City, Iowa. LB $3,586,575. dredging Delaware River Holmesburg to Cornwell Heights, Philadelphia and Bucks Counties, PENNSYLVANIA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 2/4/44.

▲ Glasgow, Inc., Glenside, Pa. CA $1,673,525. site imprvs., roads, sewers, PHILA., PA. Food Distribution Center Corp., 12 S. 12 St., Phila., Pa. The Ballinger Co., 1625 Race St., Phila., Pa., archt.-engr.

BUILDINGS—LB & CA

▲ Rheinstein Constr. Co., 21 E. 40 St., New York 17, N. Y. CA Est. $2,580,675. 16 story co-operative HOUSING APARTMENT, Brooklyn Ave. from Hawthorne to Fenimore Sts., BROOKLYN, N. Y. Mutual Apartments, Inc., c/o Katz, Waisman, Blumenthal, Stein & Weber, archts., 551 Fifth Ave., New York 17, N. Y.

▲ Kayfield Constr. Corp., 116-55 Queens Blvd., Forest Hills, N. Y. CA $1,679,000. (7 bidders) general constr. of new addn. to and modernizing existing JUNIOR HIGH SCHOOL 50, S. Third St. and Driggs Ave., BROOKLYN, N. Y. Director Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. CD 11/2, under LB.

▲ Vidoni & Motley, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds $2,900,000. 184 HOUSES on tract on Lakefield Rd. south of Jericho Turnpike, COMMACK, N. Y.

▲ Caristo Constr. Co., 26 Court St., Brooklyn 2, N. Y. CA $3,050,000. (7 bidders) general constr. JUNIOR HIGH SCHOOL 13, Fifth Ave., 106 and 107 Sts., Manhattan Boro, NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. CD 11/15, under LB.

▲ Caristo Constr. Corp., 26 Court St., Brooklyn 2, N. Y. LB $2,330,000 (8 bidders) general contract JUNIOR HIGH SCHOOL 142, Baychester Ave., E. 233 St., Bronx Boro, NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 11. CD 11/24.

▲ Planet Constr. Corp., 11 W. 42 St., New York 36, N. Y. LB $1,857,000. (8 bidders) general constr. PUBLIC SCHOOL 144, W. 122 St. between Lenox and 7th Aves., Manhattan Boro, NEW YORK, N. Y. Director Bureau Constr. 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 12. CD 11/19.

▲ Laurence J. Rice, Inc., 61-40 Maurice Ave., Maspeth, N. Y. LB $1,708,000 (9 bidders) general constr. PUBLIC SCHOOL 7, Lexington Ave. between E. 119 and E. 120 Sts., Manhattan Boro, NEW YORK, N. Y. Director Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 6. CD 11/12.

▲ Merritt & Holby, Inc., 252 Larchmont Ave., Larchmont, N. Y. CA Est. $2,200,000. 100 HOUSES on 30 acre tract on east side of King St., PORT CHESTER, N. Y. Tower Hill Homes, c/o contractor.

▲ Lakeville Estates Homes, c/o Samuel Paul, archt., 89-51 164 St., Jamaica 3, N. Y. Owner Builds $6,750,000. 175 HOUSES in tract on Glen Cove Rd. south of Rte. 25A, ROSLYN, N. Y.

▲ Joseph & Arthur Ruffalo, 34 Deer Terrace Rd., North Caldwell, N. J. Owner Builds, $3,500,000. 100 HOUSES new section of Tall Timber development on Mountain Ave., NORTH CALDWELL, N. J. Derick B. Kipp, 361 Bloomfield Ave., Montclair, N. J., archt.

▲ Turner Constr. Co., 420 Lexington Ave., New York 17, N. Y. CA $1,500,000. 1 story, 105,000 sq. ft. structural steel MFG. PLANT, incl. office and laboratory space, FREEHOLD, N. J. Irvington Varnish & Insulator Div., Minnesota Mining & Mfg. Co., 6 Argyle Terrace, Irvington, N. J. Irving S. Towsley, Otis Bldg., Phila., Pa., engrs. CD 9/11.

(Continued on page 66)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

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Alabama Power Company
Arkansas-Missouri Power Company
Arkansas Power & Light Company
Boston Edison Company
Carolina Power & Light Company
Central Hudson Gas & Electric Corporation
Central Illinois Public Service Company
Central Louisiana Electric Company, Inc.
Cia Cubana Electricidad
The Cincinnati Gas & Electric Company
City of Jacksonville, Florida
City Public Service Board — San Antonio
The Cleveland Electric Illuminating Co.
Columbus & Southern Ohio Electric Co.
Consolidated Edison Company
Consumers Power Company
Duke Power Company
Electric Energy, Inc.
Florida Power Corporation
Florida Power & Light Company
Georgia Power Company
Gulf Power Company
Hartford Electric Light Company
Indiana & Michigan Electric Company
Indiana-Kentucky Electric Corporation
Jersey Central Power & Light Company
Kentucky Utilities Company
Long Island Lighting Company
Louisiana Power & Light Company
Mississippi Power Company
Mississippi Power & Light Company
Monongahela Power Company
Montaup Electric Company
Ohio Edison Company
Ohio Power Company
Pacific Gas & Electric Company
Pennsylvania Power Company
Philadelphia Electric Company
Public Service Company of Indiana
Rockland Light & Power Company
South Carolina Electric & Gas Company
South Carolina Public Service Authority
Southwestern Gas & Electric Company
Tennessee Valley Authority
The Tucson Gas, Electric Light & Power Co.
Western Massachusetts Electric Company

POWER COMPANIES SELECT INGALLS

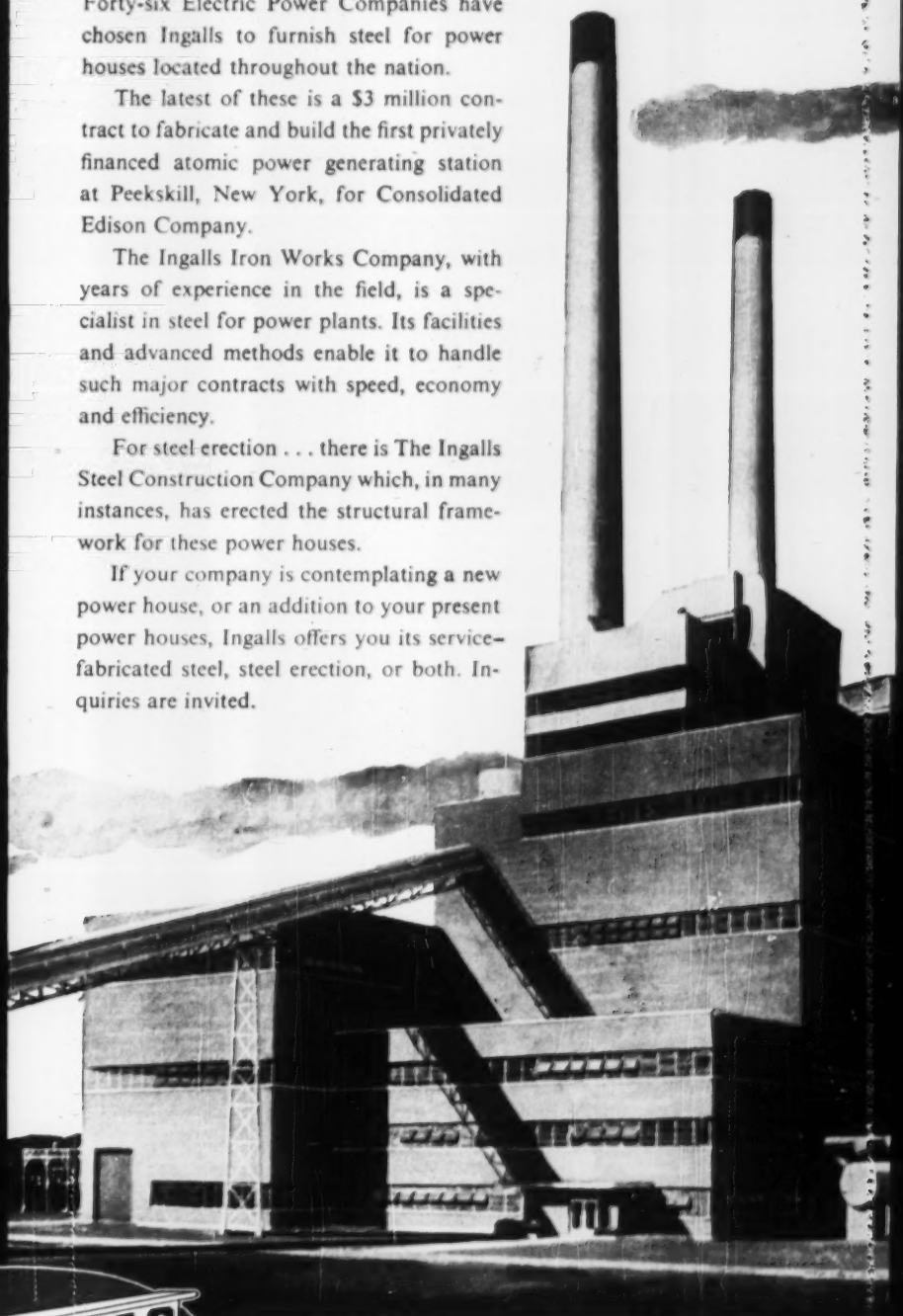
Forty-six Electric Power Companies have chosen Ingalls to furnish steel for power houses located throughout the nation.

The latest of these is a $3 million contract to fabricate and build the first privately financed atomic power generating station at Peekskill, New York, for Consolidated Edison Company.

The Ingalls Iron Works Company, with years of experience in the field, is a specialist in steel for power plants. Its facilities and advanced methods enable it to handle such major contracts with speed, economy and efficiency.

For steel erection . . . there is The Ingalls Steel Construction Company which, in many instances, has erected the structural framework for these power houses.

If your company is contemplating a new power house, or an addition to your present power houses, Ingalls offers you its service-fabricated steel, steel erection, or both. Inquiries are invited.



FABRICATING STEEL IS OUR BUSINESS

THE INGALLS

IRON WORKS COMPANY

BIRMINGHAM, ALABAMA

SALES OFFICES: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans
PLANTS: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Decatur, Ala., Pascagoula, Miss.

(Continued from page 64)

▲ **James D'Agostino**, 133 Cedar Lane, Teaneck, N. J., Owner Builds, $1,800,000. 56 HOMES, Lynn and Harriot Aves., HARRINGTON PARK, N. J. CD 4/5.

▲ **American Shopping Centers, Inc.**, 1801 Nicolette Ave., Minneapolis, Minn. and **Webb & Knapp**, 383 Madison Ave., New York, N. Y. Owner Builds. $5,000,000. 50 store SHOPPING CENTER and parking on 50 acre tract part of 200 acre tract adjoining airport, PENNSAUKEN TWP., (CAMDEN P. O.) N. J. Dan D. Milosevich, 3391 N. High St., Columbus, O., archt. CD 11/9.

▲ **Picci Bros., Douglas Dr.**, Towaco, N. J., CA $6,000,000. 200 HOMES of $30,000 class on Pinebrook Rd., known as Douglas Estates, TOWACO, N. J. Douglas Estates (Picci Bros.) Douglas Dr., Towaco, N. J. Jos & James Centanni, 263 Clinton Ave., Newark, N. J., archts.

▲ **J & P Pickard**, 505 Lancaster Ave., Haverford, Pa. Separate Contracts. Est. $3,120,000. RESIDENTIAL DEVELOPMENT, 130 units, Goshen Rd., NEWTOWN SQUARE, PA.

▲ **N. Berger**, 4129 Almond St., Phila., Pa. Separate Contracts. $2,400,000. 20th Ward HOUSING, 11 and Master Sts., PHILA., PA. Anthony Orefice, 843 N. 19 St., Phila., Pa., archt.

▲ **Blake Constr. Co.**, 33 E St. S.W., Wash., D. C., LB $12,982,000, general constr. STATE OFFICE and STATE ROAD BLDG., BALTIMORE, MD. State Dpt. P. Imprvts., 506 Park Ave., Baltimore, Md. Bids Dec. 6. CD 10/29;
Otis Elevator Co., 1012 20 St. N.W., Wash., D. C. LB $696,567, elevator work (Baltimore, Md.).

▲ **U. S. Eng.**, 24 St. and Maryland Ave., Baltimore 18, Md. rejected bids construct and finance armed services HOUSING, 1,000 units (Capehart), FORT GEORGE G. MEADE, MD. Will re-advertise. LB $14,716,070. CD 10/26, under LB.

▲ **J. D. Hedin Constr. Co.**, 2900 Newton St. N. E., Wash., D. C. CA $3,158,000. Hagerstown HIGH SCHOOL, HAGERSTOWN, MD. Washington Co. Bd. Educ., Court House, Hagerstown, Md. CD 11/15, under LB.

▲ **John Tester & Son, Inc.**, Box 1-144, Clinton, Md. CA $1,731,174. LIBRARY addn. and PHYSICS BLDG., WASH., D. C. Catholic University of America, 620 Michigan Ave. N. W., Wash., D. C. Bids Nov. 8. CD 10/29.

▲ **D. M. Fontana Constr. Co.**, 112 A St., Wilmington, Del. LB $2,439,800. SENIOR HIGH SCHOOL, Washington St. extension between Marsh Rd. and Villa Monterey, WILMINGTON, DEL. Mount Pleasant Special School Dist., Duncan Rd. and Phila. Pike, Wilmington, Del. Bids Dec. 12. CD 12/10.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—The Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond, Zone 2,
Wiley N. Jackson Co., P. O. Box 1408, Roanoke, Va.;
Robert T. Main Co., P. O. Box 1, Salem, Va. and
Thorington Constr. Co., Inc., 2106 N. Hamilton Ave., Richmond, Va., CA $4,090,149. Contr. A-5-G, Sect. A, grading, draining, paving, structures 5.79 mi. from Robin Hood Rd. to US Rte 301, Richmond City and Henrico Co. Bids Nov. 20. CD 11/27, under LB.

▲ **VIRGINIA**—The Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond, Zone 2,
S. J. Groves & Sons Co., P. O. Box 116, Station A, Toledo 11, O. LB $3,216,696 (3 bidders). Contr. C-2-G, Sect. C, grading, draining, paving, structures approx. 4.1 mi. from point 3,900 ft. north of Rte. 656 to point 100 ft. north of Ruffin Rd., City of Richmond, Chesterfield Co. Bids Dec. 11. CD 11/27.

▲† **Capitol Constr. Co.**, Box 9683, Santurce, Puerto Rico, CA $4,189,467. runway extens., constr. taxiway, shoulder stabilization, Ramey Air Force Base, ENG-08-123-57-17, AGUADILLA, PUERTO RICO. U. S. Eng., Box 4970, Jacksonville, Fla.—Bids Nov. 16, awarded Dec. 7. CD 11/27, under LB.

▲† **T. L. James & Co.** Box 531, Ruston, La. LB $11,747,419. Port Allen Lock, Inv. 57-72, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Dec. 7. CD 11/1.

BUILDINGS—LB & CA

▲† **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore, Md., CA $4,000,000. DISTRIBUTION CENTER, 1201 Hayes St., ARLINGTON, VA. Western Electric Co., 2500 Broeng Hy., Baltimore, Md. Bids Nov. 2. CD 10/26.

▲ **Richardson Constr. Co.** 3100 7th Ave. S., Birmingham, Ala. CA $1,519,375. remodel, enlarge air condition municipal AUDITORIUM, BIRMINGHAM, ALA. City, City Hall, Birmingham, Ala. Bids Sept. 25, awarded Dec. 4. CD 10/1, under LB.

▲ **Keller Constr. Co.**, Box 439, New Orleans, La. CA $2,157,324. 200,000 sq. ft. brick, concrete block West Side SHOPPING CENTER, incl. 18 stores, GRETNA, LA. August Perez & Assoc., 314 Audubon Bldg., New Orleans, La. Bids Nov. 8. CD 10/17.

▲ **Lummus Co.**, 385 Madison Ave., New York, N. Y. CA Est. $20,000,000. 200 million lbs. per year standard and high purity ethylene PLANT, LAKE CHARLES, LA. Petroleum Chemicals, Inc. (Continental Oil Co. and Cities Service Co.) Lake Charles, La. CD 12/4/51.

▲ **Southeastern Constr. Co.**, 1311 Peachtree St. N.W., Atlanta, Ga., CA $2,500,000. 4 story, 76,942 sq. ft. rein.-con. faced with limestone branch BANK, NASHVILLE, TENN. Federal Reserve Bank, 104 Marietta St. N.W., Atlanta, Ga. Awarded Nov. 30. CD 6/30/53.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **ILLINOIS**—BA 1/3—Illinois Toll Hy. Comn., Sherman Hotel, Chicago,
Cook Co.—Constr. Sect. N-7A, North Illinois strip 4.27 mi. long northwest of O'Hare International Airport.
Constr. Sect. N-10A, 6.53 mi. stretch of Tri-State tollway northeast of Des Plaines, three sections, incl. 15 bridges and interchanges at Ill. Rte. 5 near Cherry Valley and Ill. Rte. 83 (Elmhurst Rd.) near Mount Prospect.
Winnebago Co.—Constr. Sects. N-2B, 1.75 mi. segment of North Illinois Tollway north of Cherry Valley.
Eight contracts covering, furnishing, erecting, painting all roadway guard rail for 193 mi. project incl. approx. 637,000 lin. ft. CD 5/11/56.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
O. **S. J. Groves & Sons Co.**, 500 Wesley Temple Bldg., Minneapolis, Minn., CA $3,714,468, est. $4,021,000. Type T-71 and structures, 6.554 mi. USR 42, Sect. 1.89; USR 224, Sect. 6.25, F-420 (11), Medina Co.;
O. **Baker & Hickey Co.**, 2170 Eakin Rd., Columbus, O. CA $1,058,540, est. $1,089,000. Type T-35 on B-119 and structure, 0.554 mi. USR 422, Cities of Youngstown and Campbell, Sect. 4.76, Mahoning Co. Bids Nov. 27. CD 11/9.

▲ **Fattore Co.**, 6500 11 Mile Rd., Center Line, Mich. and **Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich. CA $6,780,000. 3.88 mi. West McNichols storm relief sewers, 11 and 15 in. inside diam. sewers in tunnel, PW-2171, PW-2172, PW-2173, DETROIT, MICH. City, Glenn C. Richards, comr., City-County Bldg., Detroit, Mich. Bids Oct. 30, awarded Dec. 4. (Correction—contractor's name). CD 12/7, under CA.

BUILDINGS—LB & CA

▲ **Community Constr. Co.**, 932 N. State St., Joseph J. Rogers, pres., Girard, O. Owner Builds. $5,000,000. 375 HOMES, incl. sidewalks, sewers, water lines, sewage disposal plant, Salt Spring Rd. at Morris Lane, GIRARD, O.

▲ **Koppers Co., Inc.**, Grant St., Pittsburgh, Pa., CA $24,000,000. 2 COKE OVEN BATTERIES, 87 each, EAST CHICAGO, IND. Inland Steel Co., 3210 Watling St., East Chicago, Ind.

▲ **Koppers Co., Inc.**, Grant St., Pittsburgh, Pa., CA $24,000,000. 2 COKE OVEN BATTERIES, 75 each, EAST CHICAGO, IND. Youngstown Sheet & Tube Co., Dickey Rd., East Chicago, Ind. CD 12/28/50.

▲ **Koppers Co., Inc.**, Grant St., Pittsburgh, Pa., CA $12,000,000. COKE OVEN BATTERY, 106 ovens, GARY, IND. United States Steel Corp., 525 Wm. Penn Pl., Pittsburgh, Pa. CD 3/19.

▲ **Clearing Industrial Dist.**, 38 S. Dearborn St., Chicago 3, Ill., CA $3,500,000. design and construct 287,000 sq. ft. FACTORY, 7300 S. Cicero Ave., 17-acre site, Bedford Park, BEDFORD PARK, ILL. Clark Equipment Co., Buchanan, Mich.

▲ **A. L. Jackson Co.**, 500 W. Washington St., Chicago, Ill., CA $2,500,000. 6 story office bldg., N. Wacker Dr. and Monroe St., CHICAGO, ILL. Mutual Trust Life Ins. Co., 135 S. LaSalle St., Chicago, Ill. Bids Nov. 14. CD 10/30.

▲ **Wm. E. Schweitzer Co.**, 2207 Dodge Ave., Evanston, Ill., LB $3,422,000. 6 story HOSPITAL addn., EVANSTON, ILL. Evanston Hospital Assn., 2650 Ridge Ave., Evanston, Ill. Bids Dec. 4. CD 11/8.

▲ **Procon, Inc.**, 1111 Mt. Prospect St., Des Plaines, Ill., CA Est. $2,500,000. 16,000 bbl. per day UOP fluid CATALYTIC CRACKING unit at refinery, MILWAUKEE, WIS. Clark Oil & Refining Co., 8530 W. National Ave., Milwaukee, Wis. CD 12/7.

▲ **Coleman & Moss.**, Pontiac, Mich. CA Est. $5,500,000. 375 HOMES in Harrington Hills Development, 3 mi. north of BLOOMFIELD HILLS, MICH. C. Bruton Realty Co., 15100 Fenkell St., Detroit, Mich.

▲ **Practical Home Builders, Inc.**, 13440 West Seven Mile Rd., Detroit, Mich. Owner Builds. $3,525,000. Pontiac Knolls Development, 270 brick frame HOUSES, Victory Dr., Linda Vista Dr. and East Blvd., PONTIAC, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **Montana**—BA About 1/23—U. S. Eng., Fort Peck, altering existing control shaft and constr. foundations for a second power plant at Fort Peck, on Missouri River approx. 20 mi. southeast of Glasgow, in Twp. 26 N, R 41 E, McCone Co., CIVENG-32-015-57-31. Plans deposit $10. Bids 10/9, rejected. LB $2,336,000. CD 10/17, under LB.

▲† **Montana**—BA 1/29—U. S. Eng., Fort Peck, control shaft modification and powerhouse foundation for a second power plant at Fort Peck Dam, CIVENG-32-015-57-31. CD 12/10.

▲† **Tex., San Antonio**—LABORATORY—BA 1/31—U. S. Eng., P. O. Box 1229, Galveston, 1 story, approx. 26,768 sq. ft. flight medicine laboratory bldg.; 53,042 sq. ft. bsmnt., academic bldg. Brooks Air Force Base, ENG-41-243-57-15. Est. under $5,000,000. CD 11/2.

BUILDINGS—BA

▲ **Kan., Fort Leavenworth**—HOUSING—Bids After 12/21—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., construct and finance 100 housing units, (Capehart). CD 8/13, under LB.

▲ **Tex., Austin**—STATE OFFICE—BA 1/10—State of Texas, State Bldg. Comn., Administration Bldg., state offices bldg. $3,000,000. Extended date. Kuehne, Brooks & Barry, Perry-Brooks Bldg., Austin, Atlee B. & Robert M. Ayres, 342 W. Woodlawn St., San Antonio, Cato & Austin, 2401 LaBranch St., Houston, George L. Dahl, 2101 N. St. Paul St., Dallas, Stone & Pitts, 1872 Calder St., Beaumont, and R. Max Brooks, Perry Brooks Bldg., Austin, archts. CD 11/12.

▲ **Kan., Fort Leavenworth**—HOUSING—Bids After 1/15—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., construct and finance 200 housing units, (Capehart).

▲ **Neb., Omaha**—HIGH SCHOOL—BA 1/22—Bd. Educ., 3902 Dazenport St., North Junior High School, 38th and Redick Ave. $2,300,000. L. A. Daly Co., Insurance Bldg., archt. CD 2/13.

▲ **Kan., Fort Riley**—HOUSING—Bids After 1/28—U. S. Eng., Federal Office Bldg., Kansas City, Mo., construct and finance 433 housing units, (Capehart). CD 8/21.

▲ **Mo., Fort Leonard Wood**—HOUSING—Bids After 4/20—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., construct and finance 1,329 housing units. (Capehart). CD 7/20.

HEAVY CONSTRUCTION—LB & CA

▲ **Worthington Corp.**, 401 Worthington Ave., Harrison, N. J., LB $4,311,873 (3 bidders) Sect. 1, high and low service pumping units for proposed distributive pumping station at Chain of Rocks Plant of St. Louis Water Works, ST. LOUIS, MO. City, Frank J. McDevitt, ores. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., St. Louis 3, Mo. Bids Nov. 27. CD 10/31.
Henry Pratt Co., 2222 S. Halstead St., Chicago, Ill. LB $275,759. Items A, B, C, D and E. LB $214,799. Items A, B, C and D (2 bidders) Sect. 2, rubber seat type butterfly valves. (St. Louis, Mo.);
Allis Chalmers Mfg. Co., 1205 Olive St., St. Louis 3, Mo. LB $1,168,014. Item A, LB $221,014. Items A and B (1 bidder) Sect. 3, metal seat type butterfly valves (St. Louis, Mo.);
The Chapman Valve Mfg. Co., Indian Orchard, Mass. LB $161,300 (2 bidders) Sect. 4, electric motor operated cone check valves (St. Louis, Mo.);
Transformer Co., Inc., 140 Dana St., N.E., Warren, O. LB $133,460 (6 bidders) Sect. 7, power transformers (St. Louis, Mo.);
Westinghouse Electric Corp., 411 N. Seventh St., St. Louis 1, Mo. LB $251,190 (5 bidders) Sect. 8, 5 KV switchgear and appurtenances (St. Louis, Mo.);
Graybar Electric Co., Inc., 600 S. Taylor Ave., St. Louis 10, Mo. LB $45,212 (4 bidders) Sect. 9, unit power and control centers (St. Louis, Mo.).

▲† **Guy H. James Constr. Co.**, 4901 N. Sewel St., Oklahoma City, Okla. and **J. H. Beckman Constr. Co.**, W. 12 St., Sioux Falls, S. D. CA $5,707,648. spillway earthwork, Stage II, Gahe Reservoir Proj., near Pierre, Inv. 25-066-57-44, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Nov. 28. CD 12/4, under LB.

▲† **Peter Kiewit Son's Co.**, Southwest Station, P.O. Box 3008, Wichita, Kan. CA $5,165,759. runway, primary, Clinton-Sherman Air Force Base, IFB NBy 6367, CLINTON, OKLA. Bureau Yards & Docks, Dpt. Navy, 8th Naval Dist., New Orleans (Algiers), La. Bid Nov. 8. CD 11/20, under LB.

▲ **Texas**—State Hy. Comn., Austin,
United States Steel Corp., 71 Broadway, New York, N. Y. LB $3,502,483. 0.339 mi. Hy. US 181, Corpus Christi Ship Channel Bridge, Contr. III, Proj. U 204 (8), Nueces Co. Bids Dec. 11. CD 11/27.

▲ **H. B. Zachry Co., Construction Div.**, W. Harding Blvd., San Antonio, Tex. CA Spread No. 1, 67 mi. 30 in. pipe for gas line, Rio Grande to northeast of McAllen; Spread No. 2, 67 mi. 30 in. pipe for gas line from Spread No. 1 to 67 mi. northeast; Spread No. 4, 67 mi. 30 in. pipe for gas line, all foregoing for gas pipe line between McAllen and Beaumont, TEXAS. Total est. $65,000,000. Texas Eastern Transmission Corp., Texas Bldg., Shreveport, La. CD 1/10.
Houston Contg. Co., 2707 Ferndale St., Houston, Tex., CA Spread No. 5, 61 mi. 30 in. gas pipe line between McAllen and Beaumont; Spread No. 6, 59 mi. 30 in. gas pipe line between McAllen nad Beaumont (TEXAS);
H. C. Price Co., Bartlesville, Okla., CA Spread No. 3, 70 mi. 30 in. gas pipe line between McAllen and Beaumont (TEXAS).

▲ **El Paso Natural Gas Co.**, Bassett Tower, El Paso, Tex. Own Forces. $8,840,000. 193 mi. 34 in. gas line between San Juan Basin and Topock, Ariz.; and 38 mi. 20 in. gas line between San Juan main line and Phoenix, Ariz., NEW MEXICO and ARIZONA. CD 7/11.

BUILDINGS—LB & CA

▲ **Chemical & Industrial Constr. Co.**, El Dorado, Ark. CA Est. $2,000,000. design and construct 40-ton daily nitric-acid concentrator chemical PLANT, EL DORADO, ARK. Lion Oil Co. (Div. of Monsanto Chemical Co.) El Dorado, Ark.

▲ **Rose Constr. Co.**, 1121 Walnut St., Abilene, Tex. CA $2,849,458, HIGH SCHOOL, SAN ANGELO, TEX. San Angelo Independent School Dist., San Angelo, Tex. Bids Dec. 4. CD 12/11, under LB.

▲ Mead & Mound Constr. Co., Denver Club Bldg., Denver, Colo., CA Est. $10,000,000. 25 story, 500,000 sq. ft. Murchison Tower OFFICE BLDG., DENVER, COLO. Grand total est. $14,293,546. John B. & Clint W. Murchison, 1st National Bank of Denver and International Trust Co., Denver, Colo. CD 6/20/55; Natkin & Co., 2140 S. Delaware St., Denver, Colo. CA $1,874,000, mechanical work (Denver, Colo.), Marshall & Johnson, 280 S. Penn St., Denver, Colo., engrs.; Sturgeon Electric Co., Inc., 300 Vallejo St., Denver, Colo., CA $1,100,738, electrical work (Denver, Colo.), Swanson, Rink & Assocs., 1707 Gilpin St., Denver, Colo., engrs.; Otis Elevator 1540 Cleveland St., Denver, Colo. CA $1,318,808, install elevators (Denver, Colo.), Marshall & Johnson, 280 S. Penn St., Denver, Colo., engrs.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

January 9 California

▲ Calif., Los Angeles—SPORTS ARENA—BA 1/2—City Coliseum Comn., 3911 S. Figueroa St., 384x420 ft., 3-hinge type steel trusses aluminum roof sports arena at Exposition Park. $5,500,000. Plans deposit $150. Stiles & Clements, 210 W. 7th St., archts. CD 1/15/45.

▲† Nev., Reno—DORMITORIES, etc.—BA 1/10—U. S. Eng., 1209 8th St., Sacramento, Calif., four 2 story dormitories; 1 story masonry block dining hall and heating plant; two 2 story officers quarters, ENG-04-167-57-29. $2,000,000-$3,000,000. CD 11/16.

▲† Washington—BA 3/12—U. S. Eng., 4735 E. Marginal Way, Seattle 4, constr. rockfill Eagle Gorge Dam on Green River with sand and gravel core involving 1,372,000 cu. yd. dam and tunnel excav., Kanisket, CIVENG-45-108-57-44. CD 8/19/55.

BUILDINGS—SLC

▲ Wash., Kenmore—SEMINARY—Archdiocese of Seattle, 904 Terry Ave., Seattle, soon lets general contract, 175,000 sq. ft., rein.-conc. bldg. for St. Thomas Seminary. $2,000,000. J. W. Maloney, Central Bldg., Seattle, Zone 4, archt. CD 11/14.

HEAVY CONSTRUCTION—LB & CA

▲ Consolidated Western Steel Div., U. S. Steel Corp., 5700 S. Eastern St., Los Angeles, Calif. (3 bidders) LB $2,716,590. spillway gates for Rocky Reach, WENATCHEE, WASH. Chelan County Public Utility Dist., 327 N. Wenatchee Ave., Wenatchee, Wash. Bids Nov. 30. CD 11/8.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,
Guy F. Atkinson Co., Box 259, Long Beach, Calif., LB $5,548,781 (4 bidders) constr. Harbor Freeway from 124 St. to 88 Pl., incl. 12 bridges, 3 pedestrian overcrossings, 5 pedestrian undercrossings, pumping plant and 4 retaining walls, Los Angeles Co. Bids Dec. 6. CD 11/9.

▲ CALIFORNIA—State Dpt. P. Wks., 1120 N. St., Sacramento,
Oberg Constr. Corp. & Oberg Bros. Constr. Co., 401 W. Florence Ave., Inglewood, Calif., CA $7,201,495, constr. 3 mi. sect. Ventura Freeway and 1.6 mi. sect. San Diego Freeway, incl. 10 bridges, 2 other structures and 10 retaining walls, Los Angeles Co. Bids Nov. 29, awarded Dec. 11. CD 12/3 under LB.

BUILDINGS—LB & CA

▲ Bechtel Corp., 612 S. Flower St., Los Angeles, Calif. CA Est. $23,000,000. design and construct two unit POWER PLANT, near YUMA, ARIZ. California Electric Co., 3771 W. 8 St., Riverside, Calif., and Arizona Public Service Co., 501 S. 3 St., Phoenix, Ariz.

▲ Wagner & Martinez, 181 South Park St., San Francisco, Calif., CA Est. $9,000,000. two HOSPITALS, sharing a common core on University Campus, PALO ALTO, CALIF. Stanford University, Palo Alto, Calif. and City of Palo Alto, City Hall, Palo Alto, Calif. CD 8/14, under Stanford University and City of Palo Alto, as owner.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

January 9 Ontario

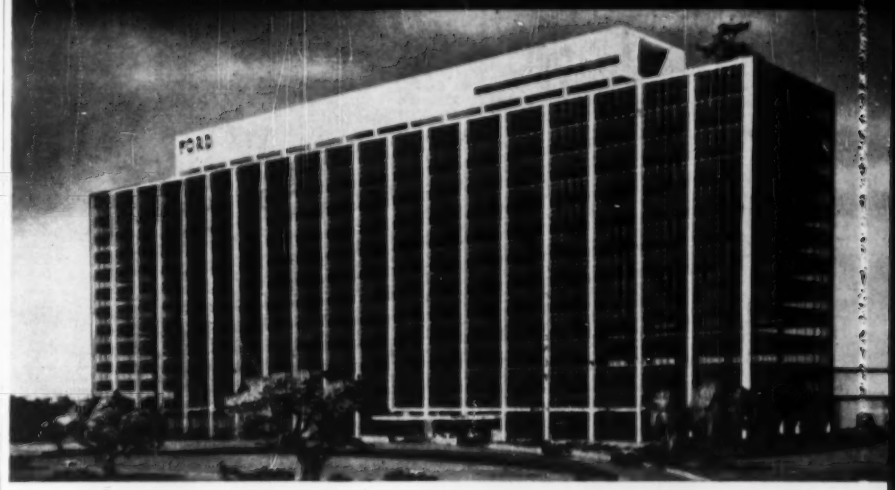
HEAVY CONSTRUCTION—LB & CA

▲ Dominion Structural Steel Ltd., 6894 Clanranald Ave., Montreal, Que., CA $3,026,962, St. Louis vertical lift bridge over ship channel, Beauharnois Canal, Soulanges Sect. of Seaway; CA $3,316,184, Valleyfield vertical lift bridges over ship chanel, Beauharnois Canal, Soulanges sect. of Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont. Bids Nov. 27, awarded Dec. 3. CD 12/3, under LB.

BUILDINGS—LB & CA

▲ Principal Investments, Ltd., 133 Richmond St. W., Toronto, Ont. Owner Builds. $3,500,000-$4,500,000. 200x600 ft. SHOPPING CENTER, ST. JOHN, N. B.

Q-FLOOR helps make Ford's new office building as modern as its cars



Ford Motor Company.....Dearborn, Michigan
Skidmore, Owings and Merrill.....Architects
Bryant & Detwiler Company....General Contractors
Weiskopf & Pickworth.....Structural Engineers

Shown above is the Ford Motor Company's magnificent new administration building which occupies a 90-acre site in Dearborn. It provides nearly 950,000 square feet of floor space, approximately 500,000 square feet of which is Q-Floor and on which 3,000 employees are working in the comfort of the latest in modern lighting and air conditioning.

Architects Skidmore, Owings and Merrill carefully designed the building to prevent obsolescence due to changing conditions in the years to come. Interior partitions are movable to provide maximum flexibility in floor arrangements, and Robertson Q-Floor construction has been used to permit complete freedom of power and telephone outlet changes and additions at minimum cost. Only with this weight-saving, cellular steel structural floor can every exposed 6" square area be the potential location of a convenience outlet.

Robertson Q-Floor construction also saves time and money. Its weight-saving factor means lower cost of foundation and structural steel. It immediately becomes a safe storage and working platform for the benefit of all trades. And because no combustible forms and falsework are required for the concrete fill, there has never been a construction fire on a Q-Floor job.

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ALASKA

HEAVY CONSTRUCTION—BA

▲† **Alaska**—BA 3/11—U. S. Eng., Anchorage, dredging small boat basin 11.7 acres in area with depth to 8 ft. at mean lower low water for the inner 20 percent and to 12 ft. for remaining 80 per center and const. two rock breakwaters 1,250 and 780 ft. long, Kodiak Harbor. $1,000,000-$5,000,000. CD 11/18/53.

▲† **Alaska**—BA 3/11—U. S. Eng., Anchorage, dreding addnl. small boat basin at Bar Point, 780,000 sq. ft. in area to depths of 15 ft. below mean lower low water or to rock and constr. two rock breakwaters 700 to 1,100 ft. long, Ketchikan Harbor. $1,000,000-$5,000,000. CD 9/15/53.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **National Road Corp.** (Technit Co., Rome, Italy) and 280 Madison Ave., New York, N. Y., U. S. A., CA $2,600,000. repairing entire road network, HAITI. P. Wks., Port au Prince, Haiti. CD 5/14.

BUILDINGS—LB & CA

▲ **Foster Wheeler Corp.**, 165 Broadway, New York, N. Y., U.S.A., CA Est. $8,000,000. CRUDE DISTILLATION UNIT 4, Amuay Refinery, VENEZUELA. Creole Petroleum Co., Caracas, Venezuela. CD 7/19/46.

▲ **Tellepsen Engineering Co.**, 1710 Telephone St., Houston, Tex., U. S. A., CA Est. $7,800,000 design and construct liquified petroleum gas PLANTS, Lake Maracaibo, VENEZUELA. Creole Petroleum Corp., Caracas, Venezuela. CD 7/30/56.

FOREIGN

HEAVY CONSTRUCTION—LB & CA

▲ **Hochtief Aktiengesellschaft**, Essen, Germany, CA $2,890,364 civil engineering works for Dibis Power Station, CA $2,449,283, civil engineering works for Baghdad Power Station, IRAQ. The Development Bd. and Ministry of Development of Govt. of Iraq, Bagndad, Iraq. Bids Sept. 24. CD 7/13 and 7/27.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Kan., Kansas City**—City, City Hall, 805 N. 6 St., reconstr. entire sewerage sys. $10,000,000. No funds available. Truman Schlup, 1401 Fairfax Trafficway, Kansas City, Kan., consult. engr. CD 11/8/54.

▲ **O., North Olmsted**—City, City Hall, storm-sanitary sewers, sewage disposal plant. $5,280,000. Hope to start in 1958 on actual constr. Floyd G. Browne & Assocs., 123 W. Church St., Marion, consult. engrs.

▲ **Texas**—Trinity River Auth., c/o Ben H. Carpenter, Southland Life Bldg., Dallas, Phase 1, raw sewage for Dallas, Grand Prairie, Irving and Farmers Branch; Phase 2, raw sewage plant for Arlington and Carrollton, $3,500,000. Forrest & Cotton, 803 Praetorian Bldg., Dallas, consult. engrs.

BRIDGES

▲ **Okla., Oklahoma City**—City, City Hall, defeated bonds Nov. 27, bridges. $2,000,000. W. W. Baker, city engr. CD 10/30.

STREETS AND ROADS

▲ **Okla., Oklahoma City**—City, City Hall, defeated bonds Nov. 27, streets. $4,000,000. W. W. Baker, city engr. CD 10/30.

EARTHWORK, WATERWAYS

▲ **Manitoba**—Manitoba Hydro-Electric Bd., 10th floor Electric Railway Chambers, Winnipeg, power plant at Grand Rapid, Nelson River to supply power to International Nickel Plant. $32,000,000-$38,000,000. CD 1/25/56.

AIRPORTS

▲† **N. Y., Rome**—DORMITORY—U. S. Eng., 111 E. 16 St., New York, Zone 3, plans by Feilheimer & Wagner, 155 E. 42 St., New York, Zone 17, airmen's dormitory, mess at Griffiss Air Force Base, $1,000,000-$3,000,000. Bids about Jan. 17. CD 8/22.

▲ **Tex., Corpus Christi**—AIRPORT IMPRVS—City, City Hall, plans by Leigh Fisher & Assocs., designers, 2225½ Riverside Dr., South Bend, Ind., airport imprvt. program. $4,000,000-$6,000,000. Reagan & McCaughan, Wilson Bldg., consult. engrs. CD 10/15.

PUBLIC BUILDINGS

▲ **Calif., Ontario**—JUNIOR COLLEGE—Chaffey School Dist., 4 and Euclid Sts., bond election Feb. 1, site purchase and constr. Junior College. $5,000,000. CD 6/1/55.

▲ **Calif., Ontario**—SCHOOL—Chaffey School Dist., 4th and Euclid Sts., bond election Feb. 1, site purchase and constr. high school, Chaffey High School Dist. $8,500,000. CD 5/8.

▲ **Calif., San Leandro**—HIGH SCHOOL—San Leandro Unified School Dist., 451 W. Joaquin St., plans by Schmidts, Hardman & Wong, 1320 University Ave., Berkeley, high school, 1st Ave. and E. Shore. $2,000,000. CD 1/19.

▲ **Colo., Denver**—OFFICE—State of Colorado, State Office Bldg., plans by G. Meredith Musick, Patterson Bldg., and Temple H. Buell & Co., 730 14th St., 7 story state office bldg. $3,500,000. CD 11/29/54.

▲ **Conn., Stratford**—SCHOOLS—Town, Town Hall, elementary school, $450,000; Chapel St. School addn. $345,000; Johnson Junior High School addn., $2,750,000; Second Hill Lane School addn., $350,000; elementary school, north of Merritt Parkway, $350,000; Sedgwick School, $500,000.

▲ **Fla., Fort Myers**—INSTITUTION—State of Florida, State Capitol, Tallahassee, plans by Connell, Pierce Garland & Friedman, 315 N. W. 27 Ave., Miami, institution of children, $3,000,000.

▲ **Iowa, Sioux City**—SCHOOL—Bd. Educ., voted $2,200,000 bonds Nov. 26, school constr. CD 11/13.

▲ **Mass., Boston**—SCHOOL—City, School Dpt., 26 Norman St., Technical High School, Back Bay area. $5,700,000.

▲ **Mass., Westfield**—SCHOOL—City, c/o Supt. Schools, Broad St., plans by James A. Britton, 315 Federal St., Greenfield, Senior High School. $3,000,000. CD 8/17.

▲ **Mass., Worcester**—HOSPITAL—City, Trustees City Hospital, 71 Jacques Ave., plans by Isadore & Zachary Rosenfeld & E. Todd Wheeler, 45 W. 45 St., New York, N. Y., hospital addn., 71 Jacques Ave. $3,000,000. Farkas & Barron, 5 Beekman St., New York, N. Y., struct. engrs. John D. Dillon, 45 W. 45 St., New York, N. Y., mech. engr. CD 3/20.

▲ **Mich., Ann Arbor**—HOSPITAL, etc.—The Regents of the University of Michigan, W. K. Pierpont, vice pres., Plant Service Bldg., plans by Swanson & Assoc., W. Long Lake Rd., Bloomfield Hills, children's hospital, $5,500,000, Bids in July; mental health research bldg., $800,000, Bids in February; plans by Giffels & Vallet, 1000 Marquette Bldg., Detroit, 2nd unit, medical science bldg., $5,000,000-$6,000,000, Bids in June; plans by Saarinen & Assoc., W. Long Lake Rd., Bloomfield Hills, School of Music, $3,600,000, Bids in April or May.

▲ **Mich., Plymouth**—HOME AND TRAINING SCHOOL—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, plans by Swanson & Assoc., W. Long Lake Rd., Bloomfield Hills, custodial bldg., powerhouse, hospital, administration bldg., infirmary and site development, Plymouth State Home and Training School. $5,000,000. CD 10/18.

▲† **Mo., Kansas City**—BUILDING—Atomic Energy Comm., 1901 Constitution Ave. N. W., Wash., D. C., 1 story unit, 320x320 ft. addn. to Pratt & Whitney Bldg., 95 and Troost Ave., for Kansas City Div. of Bendix Aviation Corp., also 40x120 ft. smaller addn. to house heating equip., and steam processing, addnl. roads, fencing. $2,000,000. Wilson & Co., 705 E. Crawford St., Salina, engrs.

▲ **Pa., Langhorne**—SCHOOL—Bd. Educ., Middletown Twp., Langhorne, plans by Haag & D'Entremont, 400 Cedar St., Jenkintown, Junior High School. $2,000,000.

▲ **Tex., Waco**—HOUSING—Waco Housing Auth., 3115 Austin Ave., plans by Wm. N. MacPherson, 114 Princess Pass, San Antonio, 400 units for 1 and 2 family size masonry public housing. $4,000,000. R. Marvin Shipman, 146 Olmos Dr., San Antonio, and Wm. K. Hall, Melba Bldg., Dallas, consult. engrs. CD 9/19.

▲ **Utah, Logan**—SCIENCE—Utah State Building Bd., 419 State Capitol, Salt Lake City, forestry and biological science bldg., 9th East between 6th and 7th North. $2,399,325.

▲ **Wash., Seattle**—SCHOOL—School Dist. No. 1, 515 Fourth Ave. N., plans by Naramore, Bain, Brady & Johanson, 904 Seventh Ave., North End High School, First Ave. N. E. and E. 115 St., $3,300,000. Bids in Summer. CD 11/9.

▲ **Ont., Ottawa**—HEADQUARTERS—Dpt. P. Wks., Hunter Bldg., plans by Hazelgrove, Lithwick & Lambert, 575 Laurier Ave. W., headquarters bldg., for Public Works Dpt., Riverside Dr. $5,000,000. Bids Apr. 1. CD 12/1/43.

▲ **Ont., Ottawa**—HEADQUARTERS—Dpt. P. Wks., Hunter Bldg., plans by Shore & Moffat, 51 Wellington St. W., Toronto, headquarters bldg. for Post Office Dpt., on Riverside Dr. $5,000,000. Bids in middle of 1957. CD 12/1/43.

COMMERCIAL BUILDINGS

▲ **Ala., Montgomery**—REHABILITATION CENTER—Alabama Baptist Hospital, Inc. & Ala. Society for Crippled Children & Adults, Inc., 472 S. Lawrence St., plans by Sherlock, Smith & Adams, archts.-engrs., 303 Washington St., 4 bldg. units, general hospital and crippled childrens center. $3,250,000.

▲ **Calif., San Francisco**—HOTEL-MOTEL, etc.—Maisel Investment Co., c/o George Meu, archt., 693 Mission St., 14 story, rein.-con., structural steel hotel-motel, 4-level garage. $4,500,000.

▲ **Conn., New London**—HOSPITAL—Lawrence & Memorial Associated Hospitals, Montauk Ave., plans by York & Sawyer, 101 Park Ave., New York, N.Y., 306-bed hospital bldg. addn. $3,500,000. Jansen & Rogan, 500 5 Ave., New York, N. Y., consult. engrs. CD 7/16.

▲ **Conn., Wethersfield**—SHOPPING CENTER—Glenal Realty Corp., 1500 Berlin Turnpike, shopping center. $4,500,000.

▲ **Fla., Coral Gables**—HOTEL—Douglas Entrance Development Co., c/o Robert E. Hansen, archt., 311 S.E. 16 Ave., Fort Lauderdale, hotel co-op apartments Douglas Rd. and S.W. 8th St. $3,500,000. CD 11/7.

▲ **Fla., Miami Beach**—HOTEL—Kaskell Corp., c/o Norman M. Giller & Assocs., archts. 420 Lincoln Rd., 14 story 500 room hotel, 6861 Collins Ave. $10,000,000. Joseph & Vladeck, E. Araben, 1134 Lincoln Rd., designers.

▲ **Ill., Kankakee**—HOSPITAL—St. Mary's Hospital, 192 S. 5th St., plans by Fugard Burt Wilkinson & Orth, 520 N. Michigan Ave., Chicago, hospital addn. $2,100,000. CD 2/28.

▲ **Mich., Saginaw**—HOSPITAL—St. Mary's Hospital, Arthur E. Treanor, chn. Bldg. Comn., 830 S. Jefferson St., plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago 3, Ill., hospital addn., $4,250,000. Bids in Spring. CD 2/24.

▲ **New York**—HOUSING—U. S. Eng., 111 E. 16 St., New York, Zone 3, plans by Turano-Gardner, 65 W. 55 St., New York, Zone 19, construct and finance, family housing (Capehart), AAA facilities, New York Area, $1,000,000-$3,000,000, bids about Jan. 31; Capehart Housing, AAA facilities, New York area, $1,000,000-$3,000,000, bids about June 18; Capehart Housing, AAA facilities, Niagara Area, $1,000,000-$3,000,000, bids about June 18. CD 8/20, under LB.

▲ **O., Steubenville**—HOSPITAL—Sisters of St. Francis, Sylvania, plans by Conrad & Simpson, Hanna Bldg., Cleveland, Zone 15, 6 story St. Johns Hospital, $2,000,000. Bids latter part of February or early March. CD 3/14/55.

▲ **Pa., Pittsburgh**—OFFICE—H. K. Porter Co., Alcoa Bldg., Zone 19, plans by Harrison & Abramovitz, 630 Fifth Ave., New York 20, N. Y., 17-story steel or aluminum, air-conditioned office, Grant St. and Sixth Ave. $7,000,000.

▲ **Tex., Fort Worth**—MOVIE CENTER—International Productions, Inc., c/o C. Carl Werner, vice pres., c/o Wyatt C. Hedrick Co., archt., 1200 T & P Bldg., movie center, off Hy. 80. $10,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Lompoc**—PLANT—Wyandotte Chemicals Corp., Alkali Square, Wyandotte, Mich., plant to strip mine earth and processing earth into oil and water absorbing cleaning project. $2,000,000.

▲ **Calif., Sacramento**—INDUSTRIAL PARK—North Sacramento Land Co., 1454 Del Paso Blvd., North Sacramento, Industrial Park, incl. warehouses, distribution and mfg facilities, south side of North Sacramento Freeway. $7,000,000. Bids spring 1957.

▲ **Conn., Oakville**—PLANT, Scoville Mfg. Co., 99 Mill St., Waterbury, expand brass fabrication plant. $3,500,000.

▲ **Conn., Waterbury**—PLANT—Scovill Mfg. Co., 99 Mill St., expand brass fabrication plant. $4,000,000.

▲ **Ill., East St. Louis**—BULK SUB-STATION—Union Electric Co., 315 N. 12th Blvd., St. Louis 1, Mo., constr. and equipment for bulk sub-station, incl. two large transformers and connecting lines. $2,000,000, incl. equip.

▲ **Ind., Alton**—PLANT—Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y., 72,000,000 tons annual capacity secondary aluminum plant. Brown & Matthews, Inc., 404 4 Ave., New York, N. Y., consult. engrs.

▲ **Md., Silver Spring**—INDUSTRIAL CENTER—Contee Sand & Gravel Co., Laurel, industrial center at White Oaks. $20,000,000-$30,000,000.

▲ **Mich., Detroit**—BUS TERMINAL—Great Lakes Greyhound Lines, 2301 W. Lafayette St., bus terminal. $6,000,000. To start in the spring.

▲ **Minn., Cohasset**—STEAM PLANT—Minneosta Power & Light Co., 30 W. Superior St., Duluth, 2nd unit Cohasset steam plant, 65,000 kw. $12,000,000.

▲ **N. J., New Brunswick**—PLANT—Squibb & Sons, 25 Columbia Heights, Brooklyn, N. Y. and North Brunswick, N. J. plant, George Rd. and Rt. 1, North Brunswick. $2,000,000.

▲ **Ore., Bend**—MILL—Brooks-Scanlan, Inc., J. M. Hollern, pres., 311 E. 14 St., Minneapolis, Minn., wood pump mill; modernize existing lumber mill in Deschutes County region near here. Est. $20,000,000, incl. equip. Sandwell & Co., 120 Sixth St., Seattle, Wash. and 1506 Alberni St, Vancouver, B. C., consult. engrs.

▲ **Wis., Milwaukee**—REFINERY—Clark Oil & Refining Co., 8530 W. National Ave., 16,000 bbl per day UOP fluid catalytic cracking unit at refinery. $2,500,000.

▲ **Manitoba**—MINES, etc.—International Nickel Co. Inc., 67 Wall St., New York 5, N. Y., U. S. A., opening 2 nickel mines, concentrator, smelter, refinery, townsite installations, 20 mi. railway at Thompson, Mystery Lake Dist. $115,000,000. CD 9/18/56, under Man., Lynn Lake.

UNCLASSIFIED

▲ **Mass., Boston**—OFF STREET PARKING GARAGE—City, Real Estate Comn., City Hall Annex, plans by S. S. Eisenberg, 739 Boylston St., Boston, 14 story, off-street parking garage, Kingston, Bedford and Columbia Sts., $2,000,000.

▲ **Texas**—OIL LINES—Passotex Pipe Line Co., City Natl. Bank Bldg., Houston, 127 mi. 20 in. crude oil lines along route from Wink to El Paso. $4,810,000.

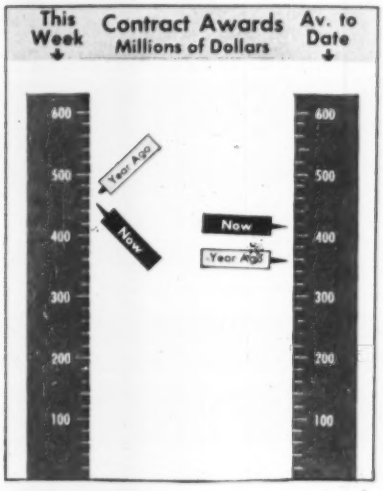
▲† **Utah**—FACILITIES—Dpt. Air Force, The Pentagon, Wash. 25, D. C., construct facilities for testing of ramjet engines at Little Mountain. $15,000,000. Bids next year. H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., consult. engr.

▲ **Manitoba**—SPUR LINE—Canadian National Railways, A. V. Johnston, ch. engr., 355-360 McGill St., Montreal, Que., spur line to International Nickel Proj. in Mystery Lake. $5,000,000. CD 4/2/52.

(Proposal Advertisement see pp. 77 to 79)

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 51 wks 1956	Chge %
	millions		
Federal	$31.4	$1,668.5	+2
State and Municipal	115.1	6,419.7	+21
Total Public	146.5	8,088.2	+16
Total Private	310.1	13,341.5	+16
U. S. Total	$456.6	$21,429.7	+16
By Type of Work			
Waterworks	$4.9	$352.2	+16
Sewerage	5.0	571.3	+44
Bridges	8.3	617.7	+17
Highways	40.4	2,413.4	+15
Earthwork, Waterways	14.0	719.4	+32
Buildings:			
Public, Excl. Housg.	35.9	2,065.6	+21
Public Housing	0.6	316.1	+28
Private Housing	67.7	5,251.8	−14
Commercial	114.9	2,035.7	+25
Industrial	113.6	5,260.4	+82
Unclassified	52.3	1,826.1	−9
U. S. Total	$456.6	$21,429.7	+16

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

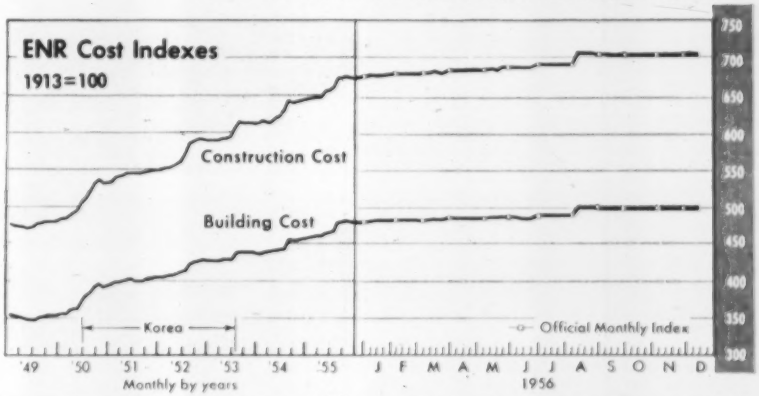
NEW CAPITAL FOR CONSTRUCTION

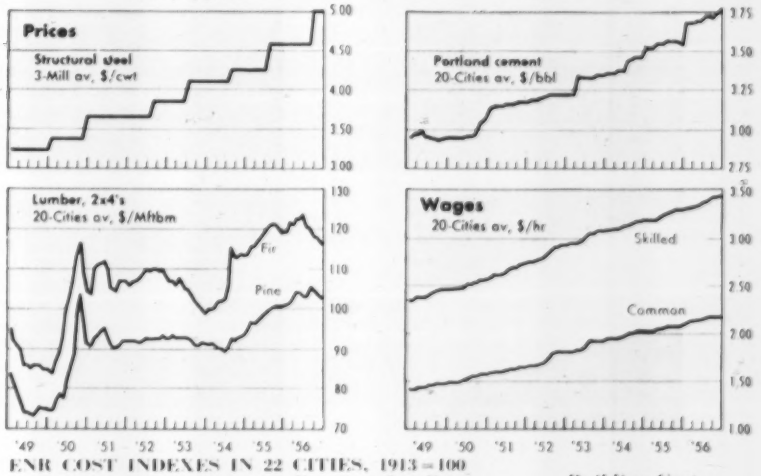
	Week of Dec. 13	Cum. 50 wks 1956	Chge '55-'56 %
	millions		
Corporate Securities	$76.2	$4,564.9	+28
State and Municipal:			
All Except Housing	71.4	4,387.0	−7
Housing	...	91.1	−6
Federal Loans	16.4	151.5	+22
Federal Aid	...	1,070.0	+25
Total Nonfederal	$164.0	$10,264.5	+9
Federal Appropriations:			
In U. S.	$...	$3,460.3	+2
Outside U. S.	...	15.9	−81
Total New Capital	$164.0	$13,740.7	+7

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Dec. 13 1956	% Change from Nov. 22 1956	% Change from Dec. 15 1955
Construction Cost	705.28	+0.2	+4.8
Building Cost	499.64	−0.1	+4.4

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.468.
To convert above indexes to 1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.555.

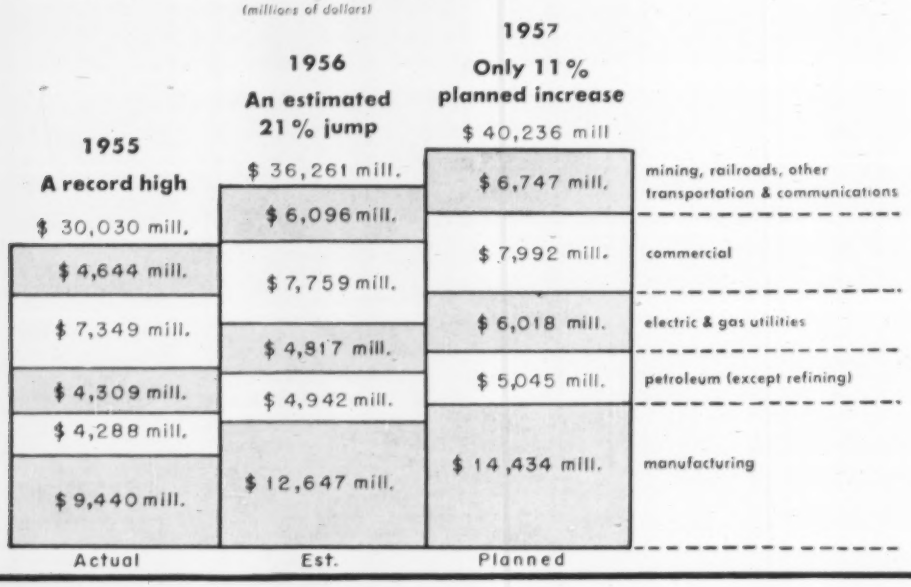




ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost Dec. 1956	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Dec. 1956	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	722	0	+5.5	441	0	+5.3
Baltimore	602	0	+1.8	498	0	+5.6
Birmingham	553	0	+3.6	455	0	+3.0
Boston	747	0	+5.4	509	0	+4.6
Chicago	790	−0.2	+3.7	506	−0.3	+4.0
Cincinnati	715	0	+6.6	491	0	+5.2
Cleveland	819	0	+4.4	508	0	+3.9
Dallas	534	0	+4.7	449	0	+5.4
Denver	696	0	+6.7	519	0	+7.4
Detroit	808	0	+4.8	527	0	+5.8
Kansas City	716	0	+1.9	505	0	+1.8
Los Angeles	731	0	+3.3	494	+0.2	+3.0
Minneapolis	757	0	+5.2	526	0	+4.8
New Orleans	564	0	+3.5	464	0	+3.2
New York	842	−0.3	+6.5	569	−0.4	+4.3
Philadelphia	747	0	+3.7	549	0	+2.6
Pittsburgh	727	0	+4.6	533	0	+5.3
St. Louis	759	0	+4.3	525	0	+4.6
San Francisco	722	−0.2	+5.5	487	+0.2	+5.2
Seattle	722	−0.3	+5.4	450	−0.5	+5.1
U. S. 20 Cities' avg	**704**	**0**	**+4.6**	**500**	**0**	**+4.5**
Montreal	561	−0.4	+2.0	438	−0.5	+2.6
Toronto	595	−1.1	+9.3	459	−1.4	+6.2

Business Plans for Capital Spending:



THE LONGER LOOK:

Record Spending to Continue in 1958

Business capital spending on new plants and equipment is heading for stability—but at a high level. Most companies plan to increase their spending in 1957 and to maintain this high level in 1958. Although this is already the biggest and longest capital spending boom on record, no downturn is in sight.

These are the principal results of a new survey of business plans conducted by the McGraw-Hill Department of Economics in the few weeks since the election and the Suez crisis. In more detail, the highlights of the survey are:

- Business now plans to increase spending 11% in 1957—compared with an increase of 21% in 1956—to a total outlay of $40.2 billion.
- For 1958, about two-thirds of the companies surveyed plan to maintain or increase spending from the 1957 level; only 30% expect a decline.
- Business expects the prices paid for new plants and equipment to be about 6% higher, on the average, in 1957 than in 1956—making the expected increase in physical volume about 5%.
- Spending plans are being stretched out—from 1956 to 1957 and from 1957 to 1958—because of cash shortages, difficulties in construction and delays in delivery of equipment; very few cancellations are reported.
- Neither the election nor the Suez crisis has had any significant effect on capital spending plans to date.

For construction this means that industrial work is still on the rise, though without the zip of this year's climb. And it will remain strong at least through 1958.

Here's how the survey results shape up in particular sectors:

- **Manufacturing**—In most lines of manufacturing, companies are planning higher expenditures next year. Steel, nonferrous metals, chemicals and petroleum report the largest increases. In these cases, planned expenditures are so large some of them may have to be carried over to 1958.

But in contrast to 1956, this year's survey shows some declines, too—in industries where consumer demand has been slack. These include the auto industry and companies making residential building materials, textiles, apparel and furniture.

The stone, clay and glass group—which covers several building materials—plans to trim spending 4% in 1957 after a big jump this year. Cement companies, in this group, report they will spend 28% less. But construction and mining machinery producers expect to boost their capital outlays 26%.

Even higher spending is already scheduled by many manufacturing companies for 1958 in the following industries: steel, machinery, electrical machinery, chemicals and rubber. The auto industry generally expects spending to level out. But in some other industries—notably paper, building materials and textiles—1958 plans now point downward.

- **Petroleum**—The oil industry has a tremendous program under way to expand and upgrade refinery capacity. Complex new processes—required for higher quality gasolines—cost far more per barrel of capacity than older processes. And alongside the new refineries, the oil industry is adding its own chemical plants, requiring still more investment.

Construction difficulties and steel shortages caused expansion and modernization in 1956 to fall far short of original goals. Though most of this is now rescheduled for 1957, it may prove im-

possible to meet present objectives before 1958.

• **Utilities**—The electric and gas utilities report plans to invest $6 billion in new plants and equipment in 1957—up 25% from 1956. This figure also will be hard to achieve. With the potential carryover added to present plans for 1958, it seems clear that another big gain is in prospect a year hence.

• **Commercial**—Planned expenditures by commercial business are up only 3% for 1957 since higher prices are expected for construction and equipment, this indicates an actual decline in physical volume.

Department stores and other chain stores report that plans for next year are down—particularly for stores in large shopping areas. Plans for smaller shopping centers, which include most supermarket construction, still show some increase for 1957. And expenditures on office buildings are continuing at a high level.

A relatively large number of the store chains say they plan to spend more in 1958 than in 1957. Apparently they plan to resume their expansion as mortgage credit becomes available. In the past, each great wave of commercial building has been followed by a severe and prolonged decline. But these present plans indicate only a brief readjustment in the making.

• **Railroads**—Expenditures in 1956 have been less than planned, because of delays in freight car deliveries and also because some railroads have had trouble raising money. For 1957 the railroads plan to increase total spending on roadway, structures and rolling stock by 8%. And most of the roads now plan to continue this level of spending during 1958.

Other transportation and communications industries plan to spend 12% more in 1957 than this year. Programs include expansion of broadcasting and communications companies, continuing re-equipment of airlines and an increasing merchant ship program.

An important factor in gauging the added volume of construction and equipment involved in 1957 capital spending programs is the belief of most businessmen that prices will be rising. The average increase expected in 1957 installations, compared with 1956, is 6%. In some industries, the average increases are expected to run as high as 8% and 10%.

This means that, after adjustment for price changes, commercial business and some manufacturing industries show declines in the physical volume of investment planned for 1957. For business as a whole, the increase in investment next year—stated in physical terms—works out to about 5%.

These plans are, of course, preliminary, because many companies do not complete their budget reviews until early next year. But in the past these preliminary surveys by the McGraw-Hill Department of Economics have accurately shown the trend of capital spending. Present plans for 1957 and 1958 will be rechecked, and the later plans reported in more detail, in the regular annual McGraw-Hill Survey of Capital Spending Plans to be made next spring.

Capital Spending Plans for 1957

	1955 Actual*	1956 Estimated*	1957 Planned	Percent Change 1956–1957
Manufacturing Industries	(Millions of dollars)			
Iron and steel	$879	$1,257	$1,659	+32%
Nonferrous metals	293	589	937	+59
Machinery	809	1,067	1,169	+10
Electrical machinery	436	606	709	+17
Autos, trucks and parts	1,128	1,719	1,375	−20
Transportation equipment (aircraft, ships, R.R. eq'pt)	274	467	691	+48
Other metalworking	729	850	1,013	+19
Chemicals	1,016	1,469	1,895	+29
Paper	518	808	978	+21
Rubber	150	193	193	0
Stone, clay and glass	498	688	663	− 4
Petroleum refining(1)	704	676	1,014	+50
Food and beverages	718	798	848	+ 6
Textiles	366	451	414	− 8
Miscellaneous manufacturing	922	1,009	876	−13
ALL MANUFACTURING	**$9,440**	**$12,647**	**$14,434**	**+14**
Non Manufacturing Industries				
Petroleum industry	$4,992	$5,618	$6,059	+ 8%
Production	3,630	4,138	4,179	+ 1
Transportation(2)	249	321	350	+ 9
Refining	704	676	1,014	+50
Marketing	364	415	452	+ 9
Other	45	68	64	− 6
Mining	318	423	461	+ 9
Coal	147	260	231	−11
Iron ore(3)	27	34	68	+100
Nonferrous	94	75	116	+55
Nonmetallic	50	54	46	−15
Railroads	923	1,263	1,364	+ 8
Other transportation and communications	3,403	4,410	4,922	+12
Electric and gas utilities(4)	4,309	4,817	6,018	+25
Commercial	7,349	7,759	7,992	+ 3
ALL NONMANUFACTURING	**$21,294**	**$24,290**	**$26,816**	**+10**
ALL BUSINESS (1)	**$30,030**	**$36,261**	**$40,236**	**+11**

*U. S. Department of Commerce, Securities and Exchange Commission, McGraw-Hill Department of Economics.
(1) Petroleum refining, included under both manufacturing and petroleum industry, is counted only once in the total.
(2) Includes oil pipelines; does not include gas pipelines (included under gas utilities).
(3) Excludes taconite.
(4) Gas utilities based on survey by American Gas Association.

Construction Markets

An On-the-Spot Report From Dallas-Fort Worth

"With the continuing and almost unbelievable flow of people and industry from the North and East into the Dallas-Fort Worth area, nothing —not even tight money—can stop the construction boom here."

That's the belief of Julian Capers, Jr., executive secretary of the Dallas Chapter of the Associated General Contractors.

"Tight money and materials shortages might slow construction somewhat from time to time—but only temporarily. The construction market continues wide open in this area," Capers added.

He predicts that construction in the Dallas-Fort Worth area in 1957 will approximate the 1956 pace, showing no great gain, nor any material decline.

Continued strength of this market stems from the steady influx of new residents and new industry into the area. Dallas County alone gains an average of 2,500 new residents each month.

As fast as Dallas-Fort Worth satisfies a construction need, a new one seems to develop. Dallas, for example, launched an all-out school building program and wiped out a critical shortage of classrooms, adding 14 new schools just last year. But, because of the population increases, the city will need from six to eight new schools a year for an indefinite number of years, according to noted architect Mark Lemmon.

Today, Dec. 20, is a red-letter day for both Dallas and Lemmon. Bids will be opened for a 42-story office building and 28-story hotel, part of the giant Lemmon-designed Southland Life Center. These two buildings alone will account for $30 million to $35 million worth of construction.

Two other major downtown Dallas projects are coming up. One is a $24-million federal building; the other a multi-million office building to be built by developer Leo Corrigan.

Throughout both Dallas and Fort Worth, and the 32 intervening miles, new construction dots the landscape. Shopping centers, in various stages of completion, ring the two cities. Others, like Dallas' $9-million Big Town, have not yet been started although commitments have been made. Completion of Big Town has been set for August 1958.

In the public works field, Dallas has a $41-million program under way. And, city officials are buying land for a $20-million reservoir on the Sabine River, 45 miles east of the city. Pipelines, pumping stations and filtration plants provide another $20 million in future construction.

The State of Texas has committed itself to completion of two big freeways which will criss-cross Dallas County. Cost of the two: $50 million to $60 million. Some sections of these freeways are under construction. Work will start on other sections as right-of-way is acquired.

And, along U. S. 80, exactly midway between Dallas and Fort Worth, is a site that may become the largest single industrial district in the nation.

It is called the Great Southwest Industrial District. Top developers from Dallas, Fort Worth and New York (including Webb & Knapp's William Zeckendorf) are joining forces to develop this 5,000-acre industrial district. Grading crews currently are working around the clock to clear the land.

Full development of this district may involve as much as $450 million worth of construction.

As in other areas, the one group that is taking it on the chin is homebuilding.

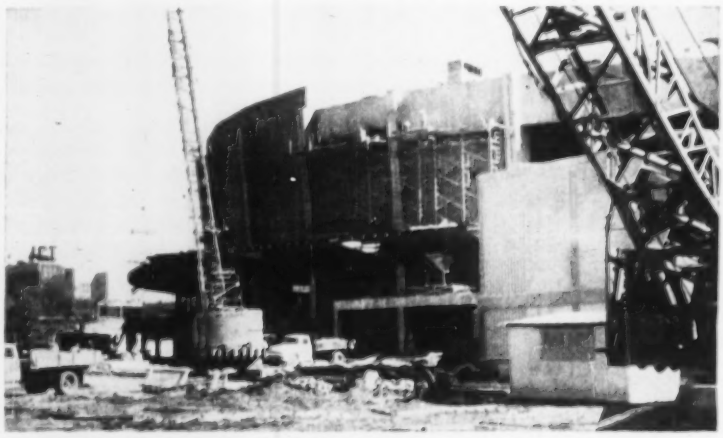
In recent months, some of the so-called marginal homebuilders have gone out of business because of tight money.

The drop-off in housing in the Dallas area was so sharp that some builders could no longer maintain enough volume to retain their organizations. In 1955, nearly 15,000 homes were built in Dallas County. This year, the total dropped to about 7,500.

Starts in 1957 probably will match the 1956 figure, according to Aubrey M. Costa, prominent Dallas mortgage banker. But, that may not be enough to meet demand. Costa estimates the city needs at least 10,000 new homes a year.

Tight money has made many homebuilders more cautious. Smaller speculative builders have turned to contract construction in many cases. And, those who once built speculatively on a large scale now trim the size of their projects.

Labor is no problem in the area—but some materials are. The steel shortage will slow some projects and cement may become a problem when the new federal-aid highway program gets fully under way, according to a spokesman for the Associated General Contractors.



MAJOR PUBLIC WORKS PROJECT in Dallas is an $8-million showplace, the city's municipal auditorium, which is now nearing completion.

Business Group Approves Federal Plant Insurance

The U. S. Chamber of Commerce has adopted a new policy supporting federal insurance for commercial atomic plants for accident liability beyond amounts covered by private insurance.

The business group said that its new policy recognizes that the need for federal indemnification of private atomic installations for third party liability is a major roadblock to swift development of peacetime atomic projects.

A private atomic power plant can now get a maximum of only $60 million in liability coverage through private insurance.

Power Firms Plan to Add 50 Million Kilowatts by 1960

The nation's electric power companies plan to increase generating capacity by 50 million kilowatts before the end of 1960, the Edison Electric Institute reported last week.

Steam power plants would account for 87% of the scheduled expansion, according to Edwin Vennard, vice president and managing director of the institute.

It is estimated that atomic power projects will account for about one million kilowatts during the period, about 2% of the total.

Makers of Roof Drainage Products Form Institute

An organizational meeting has been held for a new trade association. The new organization will be known as the Roof Drainage Manufacturers Institute.

Members of this group produce rain carrying products such as roof gutters, conductor pipe, formed valleys, ridge rolls, edging and flashing, together with accessories.

E. J. Cullen, who is connected with Inland Steel Products Co., was elected chairman of the board of directors of the new group.

Charter members of the association include:

Alabama Metal Lath Co., Ceco Steel Products Corp., Cincinnati Sheet Metal Mfg. Co., Conklin Tin Plate & Metal Co., Inland Steel Products Co., the National Steel Products Co. Division of Weirton Steel Co., Benjamin P. Obdyke, Inc., Reeves Steel & Mfg. Co., Republic Steel Corp., Superior Metal Products Co., William Wallace Co. and Wheeling Corrugating Co.

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UAW Will Bid for Engineers

Auto workers' Walter Reuther announces big drive for engineers as ESA induces the court to clarify the labor law

Hitting close to the reasons for some of the current interest in the status of professional engineers under the Taft-Hartley Act, Walter Reuther, President of the United Auto Workers union, last week announced that a membership drive will be launched to bring into the UAW "tens of thousands of engineers now outside the union" as well as 200,000 additional office workers.

Reuther's statement was made at UAW's annual Skilled Trades Conference. Reuther, at the same time, said UAW in 1958 would press for the "biggest wage increase" in the union's history for all workers—engineers, white collar, skilled and production. Three of the union's major contracts in the aircraft, farm implement and automotive industries will be up for renegotiation in 1958.

Competition for engineers between AFL-CIO craft and industrial unions and the independent Engineers and Scientists of America has been building up for some time, with civil engineers forming one of the targets. ESA, for example, has long recognized a membership potential in civil engineers, whom ESA's national representative John Taft has described, group-wise, as "the lowest paid engineers in the country." "They need the benefits of collective bargaining," he said, "more than engineers in any other classification."

• **Progress**—Some indication of the progress that's been made in the unionization of engineers came this week from the National Industrial Conference Board, which has completed a study entitled "Unionization Among American Engineers."

According to NICB, engineering unions "now claim as members nearly 60,000 of the nation's 500,000 engineers." Although the board said its findings "showed that many engineers are not completely happy with their financial position, their status as professionals, and their treatment as individuals," it concluded that as of now "engineers are far from constituting a unionized segment of the economy."

Labor organizations competing for engineers, NICB notes, are of several types: (1) independent professional unions, such as Engineers and Scientists of America, which claims 30,000 members; (2) semi-professional unions, such as the AFL-CIO American Federation of Technical Engineers, which claims 15,000 members; and (3) production workers unions, such as the auto workers and steelworkers.

ESA has claimed that some 10% of its membership consists of civil engineers. At its last convention, for example, it reported a representation of 1,000 civil engineers employed by Pacific Gas Electric Co., and of 180 working for firms in the Western Association of Engineers, Architects and Surveyors.

• **Taft-Hartley**—Along with union competition for engineers has come a renewed interest in the professional provisions of the Taft-Hartley Act.

The principal problems revolve around (1) the definition of a professional and (2) the inclusion of nonprofessionals along with professionals in bargaining units. Underlying these problems are the conflicting tenets of the interested organizing groups—ESA with its interest in the identity and isolation of professionals, and industrial unions with a tendency to meld production and professional workers. And added to this are the classification problems that arise when technicians and other subprofessionals are organized along with professionals.

Both of the major problems have been successfully pursued by ESA in the last few weeks. The Federal District Court for the District of Columbia has, in effect, ruled that the National Labor Relations Board cannot arbitrarily place nonprofessionals in bargaining units with professionals without the consent of the latter (ENR Dec. 13, p. 81). And, in another case, the Circuit Court of Appeals in New York has held that an employer cannot alter the professional characteristics of a bargaining unit by classifying nonprofessionals as professionals but must, instead, adhere to the definition of professionals as set forth in the Taft-Hartley Act.

Union May Get Payroll Data Under Supreme Court Ruling

The U. S. Supreme Court last week ruled that an employer is required to furnish payroll data to the union representing its employees, when the data is requested by the union for collective bargaining purposes.

Question involved is the extent to which company records must be made available to unions in order to comply with the Taft-Hartley Act requirement of bargaining in good faith.

Earlier this year, when the Truitt Manufacturing Co. case was decided, the court said an employer who resists wage increases on the ground that it can't afford them must supply the union with financial data to support the claim.

In that case, as in the present one, the court agreed that the National Labor Relations Board has discretionary power to compel such disclosures, noting however, that the circumstances of the particular case must be the guide in determining whether or not a refusal amounts to a failure to bargain in good faith.

The present case arose out of a request, made during contract negotiations, to a Woolworth Company in California by a local of the retail clerks union for a list of the company's employees, the number of hours they worked and their rates of pay. When the company refused the request, the NLRB sustained an unfair labor practice charge, but a federal court reversed the board, holding that no reasonable need had been shown for the data.

In reversing the Circuit Court of Appeals, the Supreme Court said: "The Board acted within its allowable discretion in finding that under the circumstances of this case, failure to furnish the wage information constituted an unfair labor practice."

Wage and Hour Law

New construction is not valid test for exemption

Application of wage and hour provisions of the Fair Labor Standards Act to the construction industry remains a ticklish problem, despite the issuance of new federal regulations last summer. Following the practical and realistic approach of the U. S. Supreme Court, the Circuit Court of Appeals in Georgia has reminded contractors that the doctrine of "new construction" isn't worth much in determining whether the law applies.

The case before the court stemmed from construction of a new television building, which would also house an existing radio station, in Albany, Ga. Hodges Contracting Co., the general contractor, thought the law didn't apply because the principal purpose of the building—television broadcasting—was something new. But the court said the fact the existing radio station would

also move into the building was enough to defeat the argument of new construction and to make the law apply.

On projects covered by the law, a contractor's chief concern, in addition to record-keeping, is payment of the minimum wage and of overtime in excess of 40 hours at time and a half. Employees engaged in commerce or in the production of goods for commerce are covered by the law. In general, construction workers are covered if the project they're working on is a part of or closely related to an existing instrumentality or channel of commerce or of a facility for the production of goods for commerce. New construction has been considered outside the law even though the project, when completed, will be in interstate commerce.

In the Vollmer decision on Louisiana's Algiers Lock, the Supreme Court exploded the myth of new construction. It's ruling that the doctrine cannot be technically applied is now reflected in the Labor Department regulations (ENR, Sept. 13, p. 152) which provide: "Coverage of any construction work, whether new or repair work, depends upon how closely integrated it is with, and how essential it is to the functioning of, existing covered facilities. Neither the mere fact that the construction is 'new construction' nor the fact it is physically separated from an existing covered plant, is determinative."

Employment Tax Liability And Control Over Workers

The Federal District Court for New Jersey has ruled that men hired by a building-repair contractor to put roofing and siding on dwelling houses were not "employees" within the meaning of the Federal Insurance Contributions Act as long as the contractor had no control over the way the work was done. The result is that the contractor was not liable for the Social Security taxes imposed by the law.

In a suit for refund of employment taxes paid over a period of years, the contractor successfully contended that the workers were independent contractors rather than employees.

The test used by the court was the extent of control exercised by the contractor over the workers. Those in question furnished their own tools and transportation, and set their own hours.

The freedom and discretion that the workers had and the contractors' lack of control over how the work was done convinced the court that the workers were not "employees".

(Labor continued on page 76)

How a seismic survey helped a town's search for more water

Like many expanding towns, Greenfield, Mass. faced the problem of increasing its water supply by drilling wells. The problem was where to put down test wells. A Gahagan Seismic Survey Crew was called in. Using portable equipment they explored 1,870 feet of subsurface profile in one day. Mr. J. F. Collins, Supt. and Engineer of the Greenfield Water Department, states that seismic depths to bedrock agreed with subsequent test borings within 3 per cent in all cases. One 8-inch well driven by the Reversed Circulation Method gave an output of nearly 1,000,000 g.p.d. of excellent water. Mr. Collins says: "We were all very well pleased with your seismic survey, and feel that we saved considerable time and money by eliminating poor locations we would have test drilled." Write on your letterhead for Bulletin 1 "Geophysical Surveys", to Geophysical Survey Division, Gahagan Dredging Corporation, 90 Broad St., New York 4, N. Y.

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AFL-CIO Mergers

Mergers on state level are mandatory, says Meany

AFL-CIO President George Meany earlier this month answered a $64 question: Can state AFL and CIO groups that refuse to merge by next year's Dec. 6 deadline be forced to do so? Meany's answer is "yes."

The question and the answer are of particular significance to the building trades that have fought for the principle of "construction by contract"—a principle affecting the livelihood of contractors and construction workers alike.

The AFL-CIO constitution provides that AFL and CIO state and central bodies "shall be effected" by next Dec. 5, but it does not specify the consequences of a failure to merge. During the year, some opposition to state mergers has come from the building trades—first on the AFL-CIO Building and Construction Trades Department level and then on local levels. Most of the opposition has stemmed from the jurisdictional conflict between the former AFL craft unions and the CIO industrial unions that have found an increasing number of ways to secure industrial construction work—particularly maintenance and repair jobs—for their own members. The building trades had hoped to force a satisfactory agreement that would protect their own interests before the AFL-CIO merger was finally completed. Such a solution has not yet been found.

Meany now has indicated that no group and no problem will be allowed to stall state mergers beyond the deadline. Where state groups fail to merge, he said, the AFL-CIO will call in existing AFL and CIO charters, draft merger charters, call joint conventions and issue new charters.

So far, less than half the state groups have merged. The 19 states in which mergers have been completed are: Alabama, Arizona, Arkansas, Colorado, Iowa, Louisiana, Maine, Minnesota, Missouri, Montana, Nebraska, New Mexico, Oregon, South Dakota, Tennessee, Utah, Vermont, Virginia and Wyoming.

City Seeks Protection Against Labor Dispute

As an outgrowth of a labor dispute last summer over the handling of non-union street-light poles by union electricians, the Minneapolis, Minn., City Council now has before it a proposed ordinance under which the city would incorporate an "escape clause" in its contracts to protect itself against delays in work contracted out.

The proposal, which would relieve the city of contract obligations in case of "real or threatened" labor difficulties, has been described as unique in governmental purchasing procedures. An assistant city attorney has advised the sponsor that the city has the legal right to protect itself against such delays.

Some 25 local manufacturers and suppliers are opposing the plan. Principal objection is that the ordinance would give a non-public third party—namely labor—a voice in controlling city contracting. Lawyers for the opposition claim that the proposal would allow discrimination against any employer because labor would be able to foment labor trouble to block contract fulfillment.

The city's street-lighting program was tied up three weeks last July, when city electricians refused to supervise unloading of light poles furnished by a non-union employer.

If the ordinance is approved, the "escape clause" would become a part of every bid and contract executed by the city.

Apprenticeship Official Named Special Assistant

U. S. Secretary of Labor James P. Mitchell has announced the promotion of William F. Patterson, Director of the Labor Department's Bureau of Apprenticeship, to the newly created post of Special Assistant to the Secretary.

Patterson will concentrate on department efforts to stimulate interest and improvement in apprentice and journeymen training programs and will represent the department at national and international apprenticeship conferences.

Painters Ease Unemployment By Use of Shorter Workweek

Immediate use of the shorter workweek as a means of sharing available employment has been announced by the Painters District Council in Detroit.

Starting the first pay period in January, union painters in the Detroit area will go on a four-day week.

Les O'Bryant, secretary-treasurer of the District Council, said the move which will affect at least 5,000 painters is scheduled in order to "spread the work." He reported that many painters in the area now are unemployed because of the "hard-money policies which have caused a cutdown in construction."

OFFICIAL PROPOSALS

Bids: January 22, 1957

Contract NA-380.004

ADVERTISEMENT
THE PORT OF NEW YORK AUHORITY
NEWARK AIRPORT
HANGAR NO. 14
PAVING AND UTILITIES

Sealed proposals for the construction of paving and the furnishing and installation of utilities for Hangar No. 14 at Newark Airport will be received at the office of the Chief Engineer of The Port Authority, Room 1160, 111 Eighth Avenue, New York 11, N.Y., until 2:30 P.M. on Tuesday, January 22, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $20.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1061, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 20, 1956

Bids: January 22, 1957

Contract NA-380.003

ADVERTISEMENT
THE PORT OF NEW YORK AUHORITY
NEWARK AIRPORT
HANGAR NO. 14
SUPERSTRUCTURE

Sealed proposals for the construction of the superstructure for Hangar No. 14 at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1160, 111 Eighth Avenue, New York 11, N.Y., until 2:30 P.M. on Tuesday, January 22, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1061, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

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THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 20, 1956

OFFICIAL PROPOSALS

Bids: January 17, 1957

Construction of Filter Plant

CONSTRUCTION OF FILTER SUBSTRUCTURES FOR FILTER PLANT

The City of Chicago invites proposals for the construction of Filter Structures for the City's General District Filtration Plant, which proposals will be received by the City of Chicago until 11:00 A.M. C.S.T. Thursday, January 17, 1957, Room 401 City Hall, at which time and place the sealed proposals will be opened publicly.

The Filter Structures form part of a 960 million G.P.D. Filtration Plant to be located within the cofferdam north of Navy Pier and east of Lake Shore Drive, Chicago, Illinois. Approximately 1,700,000 linear feet of timber piles are to be furnished and driven and 92,000 cubic yards of concrete and 20,200,000 lbs. of reinforcement steel are to be furnished and placed. The exact quantities of all material and work required are contained in Specifications and Contract Documents No. 80,391-56-3, which can be obtained from the Department of Purchases, Contracts and Supplies, Room 401 City Hall, Chicago, Illinois. A cash or certified check deposit of $50.00 will be required for each set of specifications with drawings.

A copy of the legal advertisement, which gives a brief description of the work, will be mailed to all interested parties upon request.

Direct all correspondence and inquiries to:

John F. Ward, Purchasing Agent
Room 400, City Hall
Chicago 2, Illinois

Bids: January 3, 1957

The Illinois State Toll Highway Commission Northern Illinois Toll Highway Guard Rail

GN-14, GN-67, GT-913, GT-17, GE-12, GNI-1, GNI-2, GNI-3

ADVERTISEMENT FOR BIDS

Sealed Proposals will be received by the Illinois State Toll Highway Commission, 20 North Wacker Drive, Chicago 6, Illinois, until 11:00 o'clock, A.M. Central Standard Time on Thursday, January 3, 1957 and immediately thereafter will be taken to the Louis XVI Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Illinois and publicly opened and read aloud.

Prospective bidders are hereby informed that the first sentence of Section 314a 38 of Chapter 121 of the Illinois Revised Statutes provides that—

"All contracts let for the construction of any work authorized to be done under the provisions of this Act where the amount thereof is in excess of the sum of $1,000, shall be let to the lowest responsible bidder or bidders on open competitive bidding after public advertisement made at least fifteen days prior to the opening of bids, in a newspaper of general circulation published in each of the seven largest cities of the State, as determined by the last preceding Federal census in such manner and at such intervals as may be prescribed by the Commission."

The work to be done under these contracts consists of furnishing, erecting and painting steel guard rail and steel plate beam guard rail for the Northern Illinois Toll Highway, and for State, County, Township and other roads or streets crossed by the Toll Highway, in accordance with the contract documents.

Approximate quantities of the items of work are:

Contract	Linear Feet of Steel Plate Beam Guardrail 10 ga.	12 ga.
GN-14	9,100	44,900
GN-67	11,300	76,600
GT-913	21,900	156,900
GNI-1 (a combination of GN-14, GN-67, GT-913)	42,000	278,400
GT-17	33,600	208,900
GE-12	9,700	64,500
GNI-2 (a combination of GT-17, GE-12)	43,300	273,400
GNI-3 (a combination of GN-14, GN-67, GT-913, GT-17, GE-12)	85,300	551,800

Copies of the Plans, Specifications, Proposal Forms and other Contract Documents for said Contracts are available for public inspection or purchase at the office of the Chief Engineer, The Illinois State Toll Highway Commission, Room 1654, 20 North Wacker Drive, Chicago 6, Illinois. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for Northern Illinois Toll Highway	$5.00
Proposal Form, Special Provisions and other Contract Documents, for all Contracts enumerated herein	$5.00
Plans, Location Maps, each Contract	$5.00

All proposals must be on the forms prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractural Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract, provided that the Proposal Guaranty will not be required in an amount exceeding $250,000.00. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to The Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name, he or it shall be required to furnish prior to or at the time of submission of his first proposal a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with Paragraph 4, Chapter 96 of the Illinois Revised Statutes, 1955.

If the bidder is an out-of-State corporation, it shall be required to furnish, prior to or at the time of submission of its first proposal, a certificate from the Secretary of the State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the Corporation is authorized to transact business in the State of Illinois.

Proposals will be accepted on one or any number of the Contracts.

Awards of the above Contracts, if any award be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any or all proposals and to waive technicalities.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION
By Austin L. Wyman, Chairman
December 11, 1956

Bids: January 3, 1957

The Illinois State Toll Highway Commission

NORTHERN ILLINOIS TOLL HIGHWAY
TRI-STATE ROUTE
CONTRACT T-10A
ADVERTISEMENT FOR BIDS

Sealed Proposals will be received by The Illinois State Toll Highway Commission at the office of the Commission, 20 North Wacker Drive, Chicago 6, Illinois, until 11:00 o'clock A.M., Central Standard Time, on Thursday, January 3, 1957, and immediately thereafter will be taken to the Louis XVI Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Illinois, and publicly opened and read aloud.

Prospective bidders are hereby informed that the first sentence of Section 314a 38 of Chapter 121 of the Illinois Revised Statutes provides that—

"All contracts let for the construction of any work authorized to be done under the provisions of this Act where the amount thereof is in excess of the sum of $1,000, shall be let to the lowest responsible bidder or bidders on open, competitive bidding after public advertisement made at least fifteen days prior to the opening of bids, in a newspaper of general circulation published in each of the seven largest cities of the State, as determined by the last preceding Federal census in such manner and at such intervals as may be prescribed by the Commission."

The work to be done under this Contract shall be completed in five hundred twenty (520) calendar days after the date specified in the Notice to Proceed, and consists of:

The grading, drainage, paving, the construction of appurtenances, the erection of precast concrete bridges and structural steel bridges for approximately 6.532 miles of the Northern Illinois Toll Highway in construction section T-10A thereof, beginning at a point about 2800 feet north of Golf Road (S.R. #58) and 600 feet east of East River Road at Northern Illinois Toll Highway centerline station 2620 + 00 in Maine Township, Cook County, Illinois, and extending northerly to a point 1800 feet south of Lake-Cook Road and 1300 feet east of Sanders Road at Northern Illinois Toll Highway centerline station 2964 + 91.36 in Northfield Township, Cook County, Illinois.

The approximate quantities of the principal items of work are as follows:

Item	Approximate Quantity
Roadway Excavation	156,000 cu. yd
Borrow	1,930,000 cu. yd.
Selected Subgrade	127,000 cu. yd.
Granular Subbase	69,000 cu. yd.
10" Reinforced PCC Pavement	129,000 sq. yd.
3" Bitum. Conc. Shoulders	111,000 sq. yd.
Structure Concrete	11,100 cu. yd.
Reinforcing Steel	1,466,000 lbs.

Copies of the Plans, Specifications, Proposal Forms and other Contract Documents for said Contract are available for public inspection or purchase at the office of the Chief Engineer, The Illinois State Toll Highway Commission, Room 1654, 20 Wacker Drive, Chicago 6, Illinois. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for Northern Illinois Toll Highway	$5.00
Proposal Form, Special Provisions and other Contract Documents, per copy	$5.00
Plans, per set	$25.00

All Proposals must be on the forms prescribed by the Commission, and must comply with the terms and conditions set forth in the Contract Documents.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractual Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract, provided that the Proposal Guaranty will not be required in an amount exceeding $250,000. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to The Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name, he or it shall be required to furnish prior to or at the time of submission of his first proposal, a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with paragraph 4, Chapter 96 of the Illinois Revised Statutes, 1955.

If the bidder is an out-of-State corporation, it shall be required to furnish prior to or at the time of submission of its first proposal a certificate from the Secretary of the State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Illinois.

The award of the above Contract, if any award be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any or all proposals and to waive technicalities.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION
By Austin L. Wyman, Chairman
December 11, 1956

Read the Official

Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

Bids: January 3, 1957

The Illinois State Toll Highway Commission

NORTHERN ILLINOIS TOLL HIGHWAY
NORTH ILLINOIS ROUTE
CONTRACT N-2B
ADVERTISEMENT FOR BIDS

Sealed Proposals will be received by The Illinois State Toll Highway Commission at the office of the Commission, 20 North Wacker Drive, Chicago 6, Illinois, until 11:00 o'clock A.M., Central Standard Time, on Thursday, January 3, 1957, and immediately thereafter will be taken to the Louis XVI Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Illinois, and publicly opened and read aloud.

Prospective bidders are hereby informed that the first sentence of Section 314a 38 of Chapter 121 of the Illinois Revised Statutes provides that—

"All Contracts let for the construction of any work authorized to be done under the provisions of this Act where the amount thereof is in excess of the sum of $1,000, shall be let to the lowest responsible bidder or bidders on open, competitive bidding after public advertisement made at least fifteen days prior to the opening of bids, in a newspaper of general circulation published in each of the seven largest cities of the State, as determined by the last preceding Federal census in such manner and at such intervals as may be prescribed by the Commission."

The work to be done under this Contract shall be commenced on April 1, 1957 or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958, and consists of:

The grading, drainage, paving, seeding, the construction of appurtenances, and the erection of precast concrete bridges for approximately 1.757 miles of the Northern Illinois Toll Highway, including 0.594 miles of interchange connector, in Construction Section N-2B thereof, beginning at a point about 1200 feet east of Mill Road at Northern Illinois Toll Highway centerline Station 102 + 24.50 and extending westerly and northerly to a point about 1900 feet south of U. S. Route 20 at Northern Illinois Toll Highway Station 195 + 00 all in Rockford Township, Winnebago County, Illinois.

The approximate quantities of the principal items of work are as follows:

Roadway Excavation, Unclassified	436,000 cu. yd.
Selected Subgrade	47,500 cu. yd.
Granular Subbase	37,300 cu. yd.
10" Reinforced P.C.C. Pavement	91,100 cu. yd.
3" Bitum. Conc. Shoulders	45,500 sq. yd.
Curbs and Gutters	9,500 lin. ft.
Concrete Classes M and K	1,600 cu. yd.
Reinforcing Steel	226,500 lbs.

Copies of the Plans, Specifications, Proposal Forms and other Contract Documents for said Contract are available for public inspection or purchase at the office of the Chief Engineer, The Illinois State Toll Highway Commission, Room 1654, 20 North Wacker Drive, Chicago 6, Illinois. These documents may be purchased from said Chief Engineer for the following sums per set, which sums are nonreturnable:

Standard Specifications for Northern Illinois Toll Highway	$5.00
Proposal Form, Special Provisions and other Contract Documents, per copy	$5.00
Plans, per set	$25.00

All Proposals must be on the forms prescribed by the Commission, and must comply with the terms and conditions set forth in the Contract Documents.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractual Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract, provided that the Proposal Guaranty will not be required in an amount exceeding $250,000 for any one contract. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to The Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name, he or it shall be required to furnish prior to or at the time of submission of his first proposal, a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with paragraph 4, Chapter 96 of the Illinois Revise Statutes, 1955.

If the bidder is an out-of-state corporation, it shall be required to furnish a certificate from the Secretary of the State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Illinois.

The award of the above Contract, if any award be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any and all proposals and to waive technicalities.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION
By Austin Y. Wyman, Chairman

Chicago, Illinois
December 11, 1956

OFFICIAL PROPOSALS

Bids: January 3, 1957

The Illinois State Toll Highway Commission

NORTHERN ILLINOIS TOLL HIGHWAY
NORTH ILLINOIS ROUTE
CONTRACT N-7A
ADVERTISEMENT FOR BIDS

Sealed Proposals will be received by The Illinois State Toll Highway Commission at the office of the Commission, 20 North Wacker Drive, Chicago 6, Illinois, until 11:00 o'clock A.M. Central Standard Time on Thursday, January 3, 1957 and immediately thereafter will be taken to the Louis XVI Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Illinois, and publicly opened and read aloud.

Prospective bidders are hereby informed that the first sentence of Section 314a 38 of Chapter 121 of the Illinois Revised Statutes provides that—

"All contracts let for the construction of any work authorized to be done under the provisions of this Act where the amount thereof is in excess of the sum of $1,000, shall be let to the lowest responsible bidder or bidders on open, competitive bidding after public advertisement made at least fifteen days prior to the opening of bids, in a newspaper of general circulation published in each of the seven largest cities of the State, as determined by the last preceding Federal census in such manner and at such intervals as may be prescribed by the Commission."

The work to be done under this Contract shall be completed in five hundred (500) calendar days after the date specified in the Notice to Proceed, and consist of:

The grading, drainage, paving, the construction of appurtenances and the construction of four bridge structures and four concrete box culverts for approximately 4.27 miles of the Northern Illinois Toll Highway in Construction Section N-7A thereof beginning at a point about 1400 feet south-east of Ill. Rte. 58 in Section 17, T41N, R11E of the Third Principal Meridian in Elk Grove Township, Cook County, Illinois at Northern Illinois Toll Highway centerline Station 2861 + 50 and extending southeasterly to a point about 2100 feet easterly to Elmhurst Road in Section 25, T41N, R11E of the Third Principal Meridian in Elk Grove Township, Cook County, Illinois at Northern Illinois Toll Highway centerline Station 3087 + 00.

The approximate quantities of principal items of work are as follows:

Roadway Excavation	250,000 cu. yd.
Special Excavation	155,000 cu. yd.
Borrow	1,416,000 cu. yd.
Special Fill	53,000 cu. yd.
Selected Subgrade	88,000 cu. yd.
Granular Subbase	49,000 cu. yd.
10" Reinforced PCC Pavement	144,000 sq. yd.
3" Bitum. Conc. Shoulders	79,000 sq. yd.
Guard Rail	23,000 lin. ft.
Right-of-Way Fence	47,000 lin. ft.
Structure Concrete	8,000 cu. yd.
Reinforcing Steel	1,250,000 lbs.
Structural Steel	800,000 lbs.

Copies of the Plans, Specifications, Proposal Forms and other Contract Documents for said Contract are available for public inspection or purchase at the office of the Chief Engineer, The Illinois State Toll Highway Commission, Room 1654, 20 North Wacker Drive, Chicago 6, Illinois. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for Northern Illinois Toll Highway	$5.00
Proposal Form, Special Provisions and other Contract Documents, per copy	$5.00
Plans, per set	$25.00

All Proposals must be on the forms prescribed by the Commission, and must comply with the terms and conditions set forth in the Contract Documents.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractual Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract, provided that the Proposal Guaranty will not be required in an amount exceeding $250,000.00. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to The Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name, he or it shall be required to furnish prior to or at the time of submission of his first proposal a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with Paragraph 4, Chapter 96, of the Illinois Revised Statutes, 1955.

If the bidder is an out-of-State corporation, it shall be required to furnish, prior to or at the time of submission of its first proposal, a certificate from the Secretary of the State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the Corporation is authoried to transact business in the State of Illinois.

The award of the above contract, if any award be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any and all proposals and to waive technicalities.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION
by Austin L. Wyman, Chairman

December 11, 1956

OFFICIAL PROPOSAL

RATE:

$2.10 per line (or fraction) per insertion.

CLOSING DATE:

10:30 a.m. Friday for issue out following Thursday.

SEND COPY:

Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: January 24, 1957

Construction of Water Transmission Main

ADVERTISEMENT

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until ten o'clock A. M. Eastern Standard Time on the twenty-fourth day of January, 1957 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, for furnishing materials and performing the labor for constructing a forty-two (42") inch diameter water transmission main in the Towns of Hamburg and Evans, Erie County, New York, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New Kork 3, New York.

Copies of the plans and specifications may be obtained either from the Erie County Water Authority or from the Consulting Engineers upon deposit of Twenty-Five ($25.00) Dollars, which sum will be refunded upon return of the plans in good condition within ten (10) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be done includes all materials and labor, tools, plant and equipment necessary for constructing, installing, testing and completing, ready for operation, approximately thirty four thousand (34,000') feet of forty-two (42") inch diameter water transmission main connections to existing mains, valves, air relief and blow-off facilities, manholes and other accessories and appurtenances.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bonds will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for twenty (20) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary

Buck, Seifert and Jost
Consulting Engineers
Dated: December 20, 1956.

Bids: January 8, 1957

Power Authority of the State of New York

BARNHART - PLATTSBURGH TRANSMISSION PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF
200 MVA AUTOTRANSFORMER
SPECIFICATION NO. PA-6-26
CONTRACT NO. TP1

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of one (1) 200 mva three phase autotransformer and associated equipment and delivery thereof, f.o.b. cars at destination until 10:30 A.M. Eastern Standard Time on the 8th day of January, 1957, at the Authority's office, 270 Broadway, Room 1305, New York, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for the autotransformer and associated equipment and services in accordance with the bidding schedule. Installation of the autotransformer and associated equipment will be done by others, but services of erecting engineers shall be provided by the manufacturer when and if required. Delivery of the autotransformer and associated equipment will be required May 15, 1958.

Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts and may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) Dollars for initial set of Contract Documents and Five ($5.00) Dollars for each additional set, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10% of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
General Manager

Bids: December 28, 1956

Washington Suburban Sanitary Commission

CONTRACT NO. 1910-W
FURNISHING AND DELIVERING
FIRE HYDRANTS

Sealed proposals for furnishing and delivering seventeen (17) 6-foot; twenty-five (25) 5½-foot; one-hundred-thirty three (133) 5-foot; one-hundred (100) 4½-foot and ten (10) 4-foot fire hydrants with mechanical joint elbows and accessories will be received in the office of the Purchasing Agent, Room G-15, of the Washington Suburban Sanitary Commission, 401 Hamilton Street, Hyattsville, Maryland until Friday, December 28th, 1956 at 10:30 A.M., Eastern Standard Time at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsbery, Purchasing Agent of the Commission, Hyattsville, Maryland.

T. Earle Bourne, Chairman
Frank L. Hewitt, Jr., V-Chairman
J. Norman Ager
James B. Bland
Willard A. Morris
L. S. Ray
Commissioners

Attest:
John T. Bonifant
Secretary

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed Bids (Specifications No. DC-4818) will be received at Denver, Colorado, until February 6, 1957, for furnishing and installing one 16,842-kva, 36 percent pf, 600-rpm, 4,160-volt, 3-phase, 60-cy, vertical-shaft, outdoor-type, alternating-current, hydraulic-driven generator, having water-cooled heat exchangers, for Green Springs Power Plant, Rogue River Basin Project, Oregon. Location near Ashland, Oregon. Completion time is 540 days for shipment and 120 days to install. For particulars, address Bureau of Reclamation, P. O. Box 386, Camp White, Oregon, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4819) will be received at McCook, Nebraska, until January 15, 1957, for furnishing labor and materials for Constructing Culbertson Canal Siphons, Missouri River Basin Project, Nebraska. Location northwest of Culbertson, Nebraska. Principal items are 78,400 cu. yds. excavation; 5,630 cu. yds. monolithic concrete in structures (or alternative schedule including furnishing and laying about 4,000 lin. ft. of 9-foot diameter precast-concrete pipe for siphon barrels); furnishing and installing 14 radial gates and hoists; and other work. Completion time 130 to 500 days. For particulars, address Bureau of Reclamation, P. O. Box 737, McCook, Nebraska; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Bureau of Public Roads, December 10, 1956. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., JANUARY 10, 1957, for Project 1A8, George Washington Memorial Parkway, Arlington and Fairfax Counties, Virginia. 1.181 miles grading, draining, 3 concrete bridge abutments, and other work from Chain Bridge to Leesburg Road. The approximate quantities of the more important items are 270,900 cu. yd. Excavation, 2,100 cu. yd. Concrete, and 283,000 lb. Reinforcing Steel. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the address given above. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: January 10, 1957

Delaware River Port Authority of the Commonwealth of Pennsylvania and the State of New Jersey

Administration Building
Camden, New Jersey
WALT WHITMAN BRIDGE
CONTRACT NO. 11

Sealed bids will be received for "Highway Status" on the Philadelphia, Pa. and New Jersey Approaches and the bridge structures of the Walt Whitman Bridge over the Delaware River connecting Packer Avenue, Philadelphia, Pa. and Gloucester, New Jersey, known as Contract No. 11, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:30 P. M., Eastern Standard Time, Thursday, January 10, 1957, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $15,000.00, payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialman's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the various sites of the work.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLOE
EXECUTIVE DIRECTOR

December 4, 1956

Bids: February 5, 1957

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed Proposals will be received at the office of the Director, Purchases and General Services, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A. M. E.S.T., February 5, 1957, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division IV Administration Building and Sludge Structures", and comprises the furnishing of all labor, materials, equipment and work incidental thereto, for the construction of the Administration Building, the Sludge Control Building, the Sludge Tanks, and intersection tunnel, as shown, specified and directed.

Location: The Administration Building and Sludge Structures will be located at the site of the Sewage Treatment Plant, adjacent to the southwest bank of the James River at Rockett's Wharf, northeast of the United States Naval Diesel School, in the City of Richmond, Virginia.

The proposal and other contract documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the contract documents may be obtained from the office of the Director of Public Works upon the deposit of Twenty-Five Dollars for each set. Any general contractor who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded fifteen dollars per set for each additional set. All others will be refunded fifteen dollars per set upon the return of the documents in good condition within ten days after the opening of the bids.

J. W. Huffman
Director of Purchases and
General Services

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

The Advertisements in this section include all employment opportunities—executive, management, technical selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
Part Time Work

Civil Service Opportunities
Selling Opportunities Wanted
Selling Opportunities Offered

Employment Agencies
Employment Services
Labor Bureaus

DISPLAYED ——RATES—— **UNDISPLAYED**

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure payment count 5 average words as a line.
Position Wanted ads are ½ of above.
Box Numbers—counts as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS or inquiries to Classified Adv Div of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y. January 3rd Issue Closes December 20th

HIGHWAY AND STRUCTURAL ENGINEERS - DESIGNERS - DRAFTSMEN

Several years' experience in highway and bridge design work preferred but not necessary if educational background is good.

This firm of Consulting Engineers is anxious to employ men who desire long range permanent work, who want to develop as professional engineers and who are eager to accept ever increasing responsibility.

Besides well developed training courses the company offers vacations and holidays with pay, sick leave, blue cross, free life insurance, overtime, moving allowance, and an employee profit sharing plan.

Positions in the above categories available in permanent company offices at Chicago, New York, San Francisco, Oklahoma City and Toronto.

Please reply giving experience record to

DE LEUW, CATHER & COMPANY

150 NO. WACKER DRIVE — *Engineers* — CHICAGO 6, ILLINOIS

HIGHWAY ENGINEERS

NEW OPENINGS
IN THAILAND
FOR

Construction Engineer
Road Construction Inspector
Soils Engineers
Bridge Construction Inspector
Survey Party Chief
Bridge & Road Designer

Must have college background and recent highway experience. Interviews arranged immediately for those qualified.

Send complete resume to:

SVERDRUP & PARCEL ENGINEERING CO.

1134 Locust St. — St. Louis 1, Mo.

YOUNG FIELD ENGINEER

Wanted by manufacturer of tubular steel piles. Experience in pile foundation construction necessary. Service work involves travel from central headquarters. Position is permanent and offers good opportunity for advancement. Salary commensurate with useful experience. Mail personal and experience record to

THE UNION METAL MFG. CO.
CANTON, OHIO

DESIGNERS AND DETAILERS

Permanent positions in expanding bridge consultant's office. Profit sharing plan and health insurance included. Send experience and qualification resume with approximate salary requirements to:

HARRINGTON & CORTELYOU
802 Dwight Building — Kansas City 5, Mo.

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Teaching appointments for September, 1957, available at university-associated College of Engineering in field of Civil Engineering. Salary and rank commensurate with experience and academic qualifications. Primary teaching field open as present faculty is flexible; preference, if any, would be in sanitary engineering and allied fields. Suburban location, Middle West, adjacent to large industrial center. P-3268, Engineering News-Record.

City Engineer: Unusual opportunity for graduate Civil Engineer or equivalent with professional license in southern Pennsylvania city. Experience essential in land surveying, street and sewer design and construction and related municipal work. Experience desirable in zoning and subdivision control. No structural design is involved. Would be in charge of Engineering Department, supervise survey crew and draftsmen, and would be expected to meet the public as required. Salary range $7,000 to $8,500 with usual benefits. Permanent non-political position for right man. Send resume of training and experience to: Borough of Chambersburg, 100 South Second Street, Chambersburg, Pa. Attention: J. G. Cree.

Young or middle aged man that desires a permanent position with a progressive construction concern located in the Pittsburgh area. Experience in estimating, and construction management desirable. Write stating full educational, employment, and personal data. Your inquiry will be kept confidential, and answered promptly. P-3559, Engineering News-Record, Classified Advertising Division, P. O. Box 12, New York 36, New York.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'s and engineers considered. Full information and references in first letter requested. P-3116, Engineering News-Record.

Designers—Steel, Concrete, Electrical Piping. Air-Cond., Power Plants & Industrial Bldgs. Marbarry Corp., 120 Greenwich St., N.Y.C. Rector 2-3749.

Assist. Prof.—To teach undergrad. courses in structures and applied mech. Salary depends on qualifications. Dept. of Civil Eng., Univ. of No. Dakota, Grand Forks, N. Dak.

RESIDENT ENGINEER

Expanding metals manufacturer adding to Construction Engineering Division requires 2 competent graduate Civil Engineers to handle large building construction projects in this country and overseas. Should have thorough construction supervisory background preferably in industrial buildings. Should be available next 30-60 days. In confidential letter give age, education, experience, and salary required.

P-3793, Engineering News-Record, Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

POSITIONS VACANT

Graduate Civil Engineers not over 30 and preferably single. Must have military training completed and interested in the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $100.00 per week if unexperienced with higher wages for those with some experience. Send complete history data. Martin K. Eby Construction Co., Inc., 610 N. Main, Wichita 5, Kansas.

Field Superintendent: Reliable General Contractor with forty year clientele interested in contacting experienced field superintendent for handling large and moderate size construction jobs within 300 mile radius of Chicago. Apply P-3650, Engineering News-Record.

Wanted: Job Superintendent for midwest building construction company. Age 30 to 50. Salary and bonus if qualified. Submit education, experience, qualifications, starting salary. P-3633, Engineering News-Record.

Position open with growing Midwest contractor to handle sewerage and waterworks projects, both underground and treatment plants, from estimating, bidding to completion on percentage of profits basis. Facilities available to handle 3-4 million dollar volume yearly. Build your income as high as your ability. Send qualifications to P-3636, Engineering News-Record.

Estimator: for Estimating Department in Home Office of large building contractor. Permanent position with opportunity for advancement with aggressive, growing company operating throughout the U. S. Experience in estimating desirable but not essential. Write stating fully education, employment, salary requirements, military status and personal data to Blount Brothers Construction Company, P. O. Box 949, Montgomery, Alabama.

Engineers and draftsmen structural for steel and concrete design Public Buildings. Consulting Engineers office. Call or write giving training and experience. Saul Shaw & Co., 24 Commerce St., Newark, N. J.

Equipment Maintenance Superintendent. A challenging position is now open to the right man to take charge of one of the largest fleets of on and off highway trucks, bulldozers, cranes, shovels, and other contractors' equipment in the United States. Please write, giving employment history and salaries earned. P-3735, Engineering News-Record.

Chief Estimator — Eastern Massachusetts must be able to take complete charge of estimating department of building division of large construction firm. Please furnish resume of qualifications and salary requirements. P-3691, Engineering News-Record.

Manufacturing Engineer—Nationally known expanding manufacturer has several Production Engineering openings for young graduate Mechanical or Electrical Engineers with 2-3 years engineering experience in industry. Positions involve development of new manufacturing methods, cost reduction, new product development, and manufacturing operations control. Unusual opportunity for intelligent, aggressive young man who finds himself limited for further advancement and desires more challenge and responsibility. In confidential letter give complete details on age, education, experience, and salary required. P-3763, Engineering News-Record.

Sales Engineers to introduce outstanding product in sanitary and drainage fields. Young, aggressive, well-financed company. Salary open. Location: Gulf Coast. P-3773, Engineering News-Record.

(Continued on page 84)

STRUCTURAL ENGINEER

Permanent Position in New Orleans for qualified structural engineer

with at least 10 years responsible design experience in commercial and industrial fields and capable of design, directing and checking the work of others. Salary commensurate with education and experience.

Reply in full, giving particulars concerning salary, education, experience, references and availability.

DE LAUREAL & MOSES
Consulting Engineers
201 NOLA BUILDING
NEW ORLEANS, LOUISIANA

CONCRETE ENGINEER

Wanted by large Ready-Mix Concrete supplier in northeast Ohio. Must know mix design and be able to trouble-shoot concrete. Write to following address, giving full particulars.

P-3649, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

STRUCTURAL DRAFTSMEN

FOR HIGHWAY BRIDGE WORK
In New York City and New Jersey

BROWN & BLAUVELT
468 Fourth Avenue, New York City
44 Cooper Street, Woodbury, New Jersey

CITY OF FRESNO, CALIFORNIA will accept applications for ASSOCIATE CIVIL ENGINEER $553.00 - $673.00 ASSISTANT CIVIL ENGINEER $478.00 - $581.00

40-hour week with liberal employee benefits. Graduate engineers are invited to apply. Write Fresno Civil Service Board, Room 203, City Hall, Fresno 21, California, for bulletins and applications. Final file date is January 18, 1957.

REGISTERED OR CIVIL ENGINEER

Experienced on Highways and Bridges to work for a progressive and expanding construction company, man of/or with good references desired. Please send complete resume to:

FISCHER CONSTRUCTION COMPANY
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McKEE has openings for top men to fill important, permanent positions, with excellent prospects for promotion to supervisory, staff and executive posts in our expanding organization.

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Telephone TOwer 1-2300, Cleveland, Ohio or write to Edward A. Kolner, Arthur G. McKee & Company, 2300 Chester Ave., Cleveland 1, Ohio

Arthur G. McKee & Company
Engineering offices in
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Minimum 2 years experience estimating union craft manhour requirements for constructing petroleum and petro chemical plants.

Civil, Mechanical, or Chemical Engineering Degree required, plus minimum 5 years responsible supervision of union crafts in construction of above plants. Some engineering design also preferred.

OR

Minimum 2 years accredited college engineering with 5 years estimating and 10 years construction experience as detailed above.

Mail confidential, complete chronological resume, including education and employment (names and addresses of employers, dates employed, positions held and scope of responsibility, salaries received, nature and location of projects estimated and supervised, etc.) to Personnel Department.

HYDROCARBON RESEARCH, INC.
115 Broadway New York 6, N. Y.

STRUCTURAL ENGINEER

Large New England fabricator has permanent position for young structural engineer—position will eventually lead to Chief of Engineering Department. Must have Conn. C.E. license or qualifications to take examination. Give full qualifications in letter.

P-3750, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

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Prefer several years or more experience in any of these fields:

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BUILDINGS
EXPRESSWAYS
HYDRO PROJECTS
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Will consider lesser experience with good educational background, including several recent graduates to round out a planned expansion program. Occasional openings for combination field men. These are permanent additions to our regular staffs.

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Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income plus life and disability insurance. Blue Cross. Moving allowance.

Please write fully, including salary data, to

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ENGINEERS — ARCHITECTS
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*We are designers of the technical facilities for the Arnold Engineering Development Center, operated by our subsidiary, ARO, Inc

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IMMEDIATE OPENINGS

SR. ENGINEER
Mechanical Design
CHIEF
Material Control
ASST ACCOUNTANTS
SR. CLERK
Material Control

Send complete resume in confidence to:
P-3682, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

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- *Permanent employment for qualified men*
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Progressive Firm
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Application Form on Request
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Submit Resume - Minimum Salary

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$6600 to $9000

Positions available for two men in our well established and expanding Sanitary Engineering Department.

Requirements: Engineers with a college degree or equivalent in sanitary engineering and a minimum of 5 years' progressive experience on design of sanitary engineering projects.

Submit experience resumes and references.
Interviews will be arranged.

PATCHEN AND ZIMMERMAN, ENGINEERS
AUGUSTA, GEORGIA

ENGR.-COORDINATOR

Minimum 5 years experience job engineering or equivalent on petroleum and petrochemical plants.

Civil, Mechanical, or Chemical Engineering Degree required, plus minimum 8 years experience as responsible job site Field Engineer. Some construction supervisory experience also preferred.

Mail confidential, complete chronological resume, including education and employment (names and addresses of employers, dates employed, positions held and scope of responsibility, salaries received, nature and location of projects supervised, etc.) to Personnel Department.

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Having experience with heavy material handling equipment

Permanent Position For Qualified Men

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INSURANCE
VACATION

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Chief Engineer for interview

THE WELLMAN ENGINEERING CO.
7000 CENTRAL AVE.
Cleveland 4, Ohio
Telephone EN 1-0842

ARCHITECTURAL ENGINEER

Architectural Engineer between ages of 25 and 35 with interest in design of industrial buildings and structures.

Excellent opportunity with consulting engineering firm in Middle West. Liberal benefit plans and good working conditions.

Send resume of education and experience with statement of salary requirements to:

P-3222, Engineering News-Record
529 No. Michigan Ave., Chicago 11, Ill.

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TO CONDUCT FIELD INVESTIGATIONS OF SEDIMENTARY GEOLOGY FOR PURPOSE OF DEVELOPING SOURCES OF RAW MATERIALS FOR PORTLAND CEMENT. HEADQUARTER IN CHICAGO BUT BE FREE TO TRAVEL. GIVE FULL DETAILS AND SALARY DESIRED. REPLY TO:

P-3248, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

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With at least 5 years of responsible experience in municipal and industrial waste field.

Please send resume or call
Miss Ferguson
WI 7-4600

GIBBS & HILL, Inc.
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New York 1, New York

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FOR HIGHWAY BRIDGE WORK

SENIORS and JUNIORS

Work in New York City and New Jersey

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Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

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400 W. Madison St. Chicago 6, Ill.

CIVIL ENGINEER

Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-3223, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

••CIVIL ENGINEERS••

Minimum 3-5 years experience in structural design and construction of offshore structures, piers, drilling platforms, etc. Supervisory experience and ability to prepare economic and technical studies essential. Graduate civil engineers needed by major oil company operating in Venezuela. Salary commensurate with experience.

SUBMIT RESUME TO:

P.O. BOX #35
Bowling Green Station
New York 4, N. Y.

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CONSTRUCTION EQUIPMENT

Opportunity for sales engineer work for energetic young engineer or construction man, 25 to 35 years of age for sales work in established territory with company operating on nation-wide basis furnishing metal forms for sale or rent to handle concrete forming work. General construction experience or some civil engineering training desirable. Must want to sell. Give full details of background and experience in first letter to W. H. Witt.

Economy Forms Corporation

P. O. Box 128, H. P. Station

Des Moines, Iowa

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In the field of Crawler Tractors, Motor Graders, Diesel Engines and Earthmoving Equipment.

Due to vast mid-west expansion program, openings exist in our Research, Manufacturing and Engineering Departments for:

Design Engineers
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Plant Engineers
Metallurgists
Mathematicians
Physicists
Architects

Interested persons are invited to call in person or send a resume of qualifications to Mr. R. R. Haarlow, Professional Employment Co-ordinator. All inquiries will be treated on a confidential basis

EMPLOYMENT DIVISION
CATERPILLAR TRACTOR CO.
Peoria, Illinois

Engineers Architects

Highway Designers—Draftsmen
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Bridge Designers—Draftsmen
Harrisburg, Pa. College Park, Md. Ft. Lauderdale, Fla., Jackson, Miss.

Architectural Designers—Draftsmen
Rochester, Pa.

Civil Engineering Draftsmen
Jackson, Miss.

Ink Tracers—Computors
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Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., INC.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

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PROJECT ENGINEER—B.S.M.E. or CHEMICAL ENGINEER—Approximately 6-10 years experience. Design, installation, and testing of processing and materials handling equipment and machinery.

PACKAGING ENGINEER—B.S.M.E. desirable, not essential. 3-5 years experience in container manufacturing and filling, and associated equipment.

METHODS ENGINEER—B.S.M.E. Experience in time study and methods.

Please send detailed resume

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100 Market Street Camden 1, N. J.

BECHTEL

AREA ENGINEERS
SENIOR ENGINEERS

Foreign Employment
Sumatra or Saudi Arabia

Field Engineers with refinery or related construction experience.

Office Engineers with heavy industrial construction experience on planning, estimating, costs, material takeoff scheduling.

No Family Housing

Send resume to:
Manager of Employment & Placement
Industrial Relations Division

BECHTEL
Engineers and Builders for Industry
220 Bush Street
San Francisco 4, California

POSITIONS VACANT
(Continued from page 80)

Office Engineer and Assistant Engineer (two positions), desired for progressive Class 1, New England Railroad. Immediate placement for men with proper qualifications. State age, references, experience, education, salary required, when applying. All correspondence confidential. P-3739, Engineering News-Record.

Construction Superintendent for college construction in central New Hampshire. Excellent compensation. Only top notch man will be considered. Reply to P-3777, Engineering News-Record.

Production Control Asst with steel fabrication exp. large eastern producer, opportunity. P-3785, Engineering News-Record.

Engineer—Structural Steel Sales Promotion we are searching for a young Civil Engineer, preferably under 30, to handle technical and promotional work with customers of the structural steel fabricating industry. Headquarters will be in our regional office at Los Angeles, California. Some travel through southern California and Arizona required. Applicants should have a B.S. in C.E. and preferably be registered. Experience in steel design and construction desirable. Salary open, depending upon experience. Insurance and retirement plans available. Send complete resume, recent photo if available, and salary requirements by mail to American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, New York.

Civil Engineer, registered preferred, with minimum five years experience in industrial building design and construction. Must have executive ability. Excellent future for qualified man with small company operating in Hudson Valley, New York. Reply to P-3752, Engineering News-Record.

Soils Engineer—C.E. for design work in our New York Office. F. R. Harris, Inc., 27 Williams St., N.Y.C.

Superintendent Ready-Mix Concrete Plant— Portable and stationery. Man must be capable of Ready-Mix concrete plant erection—personnel supervision and complete maintenance of concrete plant and equipment. Give complete resume of past and present employment and salary desired in first letter. Company benefits: Health and Group insurance—vacation after one year employment. Address letters to Concrete, Inc., 2216 So. Custer, Wichita, Kansas.

Civil Engineers, Designers, Draftsmen experienced in the design of sewers pumping stations, sewage treatment plants, water supply systems, structural and hydraulic design, hydraulic computations, specs. O'Brien & Gere, 400 E. Genesee St., Syracuse, N. Y.

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Wanted Engineers, Designers, Draftsmen All lines. Chemists, teachers and industrial engineers. Recent grads. Cleveland Engineering Agency 2132 E. 9, Cleveland (15) Ohio.

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Salaried Positions $6,000 to $35,000. We offer the original personal employment service (established 46 years). Procedure of high standards individualized to your personal requirements. Identity covered. Particulars—R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

POSITIONS WANTED

Superintendent—25 yrs. practical experience, business-engineering background for Highway construction & or allied operations. PW-3580, Engineering News-Record.

Surveying field party, 3 or 4 men, fully equipped, well exp. in all types of work. Under Licensed supervision. Willing to travel. PW-3667, Engineering News-Record.

Civil Engineer, 36, with 12 years experience as project engineer on large dams, powerhouses, subway. Presently employed as executive assistant on estimating, cost control and planning. Available as construction manager or chief engineer etc., for location with permanence and future. Salary requirements $1,000.00 per month. PW-3708, Engineering News-Record.

Construction Engineer or Superintendent
AVAILABLE FOR INTERVIEWS

Experience includes highways, dams, sewer and water and other heavy construction. Presently completing Foreign Project. Will arrive in States between Xmas and New Years. Please contact

PW-3781, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

POSITIONS WANTED

Superintendent, Heavy & Bridge construction, 19 years experience, bid to completion, $200. PW-3683, Engineering News-Record.

Project Engineer, 37, registered N. Y., completing 4 years with A-E on European air bases. Experienced in office administration, and foundation, road, water, drainage and POL design and construction. Seeks permanent administrative position with future possibilities in direction. Location preferred in southern U. S. or South America. PW-3568, Engineering News-Record.

Construction Supt. 43. Past employment includes work on multiple and project housing, land development, earthwork, and heavy concrete paving. Capable of letting sub-contracts and coordinating sub contractors. Construction field engineering background. Cognizant of necessity of accurate and perpetual job cost accounting. Have also supervised extensive sewer installations. PW-3714, Engineering News-Record.

Structural Engineer, BCE, MCE, Registered, age 26, 5 yrs experience in design and supervision of design of all types of structures, desires position overseas, office or field, prefer Hawaii, S. A. or Europe. PW-3697, Engineering News-Record.

Project Manager or Assistant Project Manager-10 years experience as project manager and executive head of construction company in overseas areas—Desire foreign or domestic assignment—Fluent in Spanish some French and German. PW-3698, Engineering News-Record.

Equipment Superintendent—Many years of experience in handling maintenance and parts for heavy off-the-highway equipment. Immediately available; prefer mid-West or West location. References furnished. PW-3791, Engineering News-Record.

POSITIONS WANTED

Construction Cost Engineer—Capable set up systems and procedures for field office economically. Estimates; contract negot; budget & cost control know-how. Age 37. Min. Sal. req. $8500. Relocate domestic or foreign. Some Spanish. PW-3676, Engineering News-Record.

Purchasing Agent and Expeditor familiar with all types of general construction procurements and shipments. Negotiate subcontracts. PW-3702, Engineering News-Record.

Civil Engineer: Five years experience in field on bridge, highway and airfield construction. Particularly strong in concrete. Seek interesting and responsible position. Available Feb. 15. PW-3784, Engineering News-Record.

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B.S.M.E.—Engineer or Foreman, want foreign area; prefer Europe. 6 yrs. exp. with boiler, turbine, and process piping as designer, detailer, and pipe foreman. PW-3759, Engineering News-Record.

Lt Colonel, Corps of Engineers, leaving active duty January 57. Available for position anywhere as architect, construction, construction management, planning or general engineer. PW-3775, Engineering News-Record.

SELLING OPPORTUNITY WANTED

Philadelphia Representative with Warehousing Facilities handling AAA Re-Steel Accessories seeks additional lines. RA-3615, Engineering News-Record.

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(Classified Advertising)

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Send NEW ADVERTISEMENTS or Inquiries to: Class. Adv. Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y. January 3rd issue closes December 20th.

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

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New Jersey Licensed Engineer who likes municipal work. Must be able to invest Ten Thousand Dollars ($10,000.00) to obtain substantial share of well established private engineering company. Apply BO-3554, Engineering News-Record.

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CRANE BOOM — 60 to 80 Ft. Long
With TAG LINE and FAIR LEADS
for MODEL L 80 LORAIN
Write full description & price
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Learn latest methods to organize and run work. Prepare for the top jobs.
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150 tables cover structural and finish in hours—tradesmen, helpers, foremen, and materials allowing normal waste. 1956 printing, ten day free inspection, money back guarantee, $10.00 postpaid:
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W-3516, Engineering News-Record
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655 P&H Dragline, 45' boom
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77 Lorain 1½ yard Shovel
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43 Marion 1 yard Backhoe
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GReenwood 7-7200

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18" WF @ 50# x 60'/65'
21" WF @ 62# x 60'/65'
21" WF @ 68# x 60'/65'
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Excellent Condition

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True Partnership Needed

Outstanding examples of what can be accomplished by local financing and construction of water resource projects are currently to be seen at Priest Rapids Dam and Brownlee Dam. Priest Rapids, notable for its record-size single construction contract of $92 million, is to be a concrete structure on the main stem of the Columbia River in Washington. It is being built to develop 630,000 kw by the Grant County Public Utility District. Brownlee, first of three projects licensed for construction along the upper Snake River on the Oregon-Idaho line, is to be a rockfill dam to develop 360,400 kw. It is a project of the Idaho Power Company.

Both are being rushed to meet power demands of the Northwest. Both are being built in the place of federally planned projects. Both have been called partnership projects.

But is either a true partnership project in the literal sense? In each case the federal government had planned an optimum project, a multipurpose dam to create flood water storage while also developing power—and, in the case of Priest Rapids, navigation facilities. It is not necessary to argue that the federal government should have been allowed to build its planned projects to raise question as to whether the best decision was made when the Washington public power district and the Idaho Power Company were permitted to build the projects now started. The fact is that these approved projects do not provide appreciable flood storage, and such storage is deemed desirable. Proof of this is the latest proposal (p. 19) for a high Pleasant Valley Dam on the lower Snake River to recoup some of the storage sacrificed upstream where three low dams were licensed instead of one high one in Hell's Canyon.

As indicated in a recent analysis of the partnership policy in resource development (ENR Nov. 22, p. 21), the Federal Power Commission approved these projects because the early power generation they promised seemed to outweigh benefits at a much later date from more comprehensive projects. A mechanism for federal participation was not available. In short, these are not really partnership projects. And they probably could have been.

The first four years of the Eisenhower Administration were noteworthy for talk of partnership in resource development. The second four years ought to see accomplished some of the true partnership in multipurpose projects, which has mostly been discussed up to now.

The very sound idea that federal and local interests should in many instances cooperate on multipurpose river projects to avoid underdevelopment and to allocate costs where they justly belong should be further defined by the Administration. In a way, this idea is complicated and probably was misunderstood by the voters who seemed opposed to partnership in the November elections. But it needn't be so complicated. The federal government has a responsibility to plan projects for full use and control of waters in the nation's major river basins. And, on the other hand, local financing, construction and control of water resource projects is the ideal, although not always possible. Therefore, for fullest development and fairest allocation of costs, federal plans ought to be satisfied as nearly as possible; and local financing ought to be accomplished to the limits of the beneficiaries' capacity to pay for benefits received.

The current work on the St. Lawrence River stands as practical evidence that true partnership on multiple-purpose projects can be made to work. At Priest Rapids and Hell's Canyon, it was not given a chance. The urgency of those situations may have justified the decisions made. But the real urgency now is to improve the partnership formula—in time for use on the Pleasant Valley problem, if needed.

A World-Wide Requirement

Engineers in the United States often have been urged to enlarge their horizons of interests and knowledge beyond the purely technical aspects of their jobs as a means for enhancing their service to the community as well as improving their economic status. That the need for such action is not limited to the U.S. but is world-wide is apparent in recent news from South Africa. There, the City Engineer of Capetown, S. S. Morris, in addressing the South African Institution of Civil Engineers, made this cogent observation:

> "An engineering undertaking is more than just a technical exercise. A road, a railway, a harbor, are not ends in themselves; they are but means to an end—to convey produce from farm to factory; to bring tractors from overseas to the farm; to establish new industries; to create new opportunities for employment, and, generally, to develop further the resources of the country.
>
> "If, therefore, the engineer wishes to speak with authority in spheres where policy is framed, he must learn to look beyond technicalities. He must acquire a background of knowledge of the country's economic life, of business and agricultural policy, of sociological and political trends; and since business, trade and politics are international in their ramifications, he must look even beyond (national boundaries) and make world affairs his business."

What a transformation would be wrought if engineers all around the world were to adopt that approach to their daily tasks. It will not be an easy thing to do. Engineers, generally, are busy men. The time they can devote to matters outside of their daily tasks is limited. But it can be done if the will to act is there.

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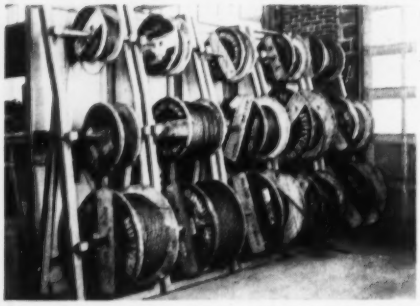

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